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REVIEW

OF THE

AGRICULTURE

OF

LOWER CANADA,

WITH SUGGESTIONS FOR ITS AMELIORATION;

FIRST PUBLISHED IN A SERIES OF COMMUNICATIONS,
IN THE "MONTREAL GAZETTE,"

BY

WILLIAM EVANS, ESQ.,

Secretary-Treasurer of the Board of Agriculture for Lower Canada.

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AGRICULTURE IN LOWER CANADA.

[First Published in the Montreal Gazette.]

In my last monthly agricultural report, published in the *Montreal Gazette*, I endeavored to give the result of this year's harvest, and it is therefore unnecessary at this season of the year to make any further allusion to the crops of this year; but in order to avail myself of the privilege granted to me of having my communications on agriculture published in the *Gazette*, I shall occasionally, as opportunity serves, endeavor to submit an outline of the present state of agriculture in Lower Canada, and demonstrate as far as I am capable of doing so, the improvements that may be required to be introduced. In this attempt, I must of course confine my remarks within very narrow limits, to induce their publication. I cannot expect that I shall be able to do jusrice to a subject of such importance, in my occasional communication I shall however, do all in my power to give a correct view of our agricultare; and in doing so, I beg to assure agriculturists that I dn not wish to give offence to any one by my remarks which I may think it necessary to submit. My object on the present occasion is wha1 it always has been in my csmmunications on the same subject—to prouote agricultural improvement as the best means to advance the interists agriculturists, as well as the general interests of our country. It is necessary that we should be perfectly aware of the true state of agriculture, that we may introduce improvements in our system if required.

It will be admitted by all experienced agriculturists that sufficient draining and good ploughing are most essential to good farming, and that remunerating products cannot be expected from arable land where the draining and ploughing are imperfectly executed. In Lower Canada it is quite certain that both draining and ploughing are very defective in general, and in sections of the country where it is most required that both be as near perfection as possible. A large portion of Lower Canada is of very level surface, and the soil is a strong clay, naturally of exellent quality; but to make it productive, careful draining, is of the first importance. No doubt draining has been executed to a considerable extent, but in most cases uot sufficient, and in almost every case the drains that are made are not regularly cleaned or kept in proper order. Their construction is also objectionable: the sides of the drains are in numerous instances, almost perpendicular when they should be sloped — the excavated earth is allowed to accumulate on the banks of the drains, and the land is highest where it should be lowest, and the levels and out-lets are not carefully attended to. Drains will not act, if they have not sufficient fall, and if the grass and weeds are not constantly cleared out of them. In a flat level country, the draining repuires much more attention than where the surface is undulating, and a sufficient fall for the drains almost always attainable.

As regards ploughing, according to my ideas, I would consider it to be generally defective. The ploughing and ridges are not straight, the furrow-slice is too wide in proportion to its thickness, and consequently is too flat to admit of the soil drying to harrow well; and the furrow between the ridges is too wide and shallow, because it is not finished properly by effectively running the plough in tho subsoil of the furrow, after the surfaee is all well turned over. When the furrows between the ridges are not properly cleaned out, the moisture remains in and under the ploughed surface, and cannot run off, because the bottom of the furrow is only level with the under side of the plouged soil, and the furrow left in this unfinished state causes a waste of nearly a third of the land. The obvious remedy for these defects is,—to plough straight, and have the furrow-slice in due proportion, 5 inches deep by eight or nine iuches wide or six inches deep by 9 or 10 inches wide carrying out the same proqortion if ploughed deeper; and when the ridges are finished pass the plough deeply in each furrow, thus making a sufficient drain to carry off the water from the ploughed soil to the head land. The headland should be carefully ploughed, and a deep furrow between it and the ridges, and this furrow to be made so as to carry off the water from all the furrows of the field, with outlets from it into the main drains at the end or side of the field. By adopting these simple and easy improvement, the land would be in good condition at the first commencement of the spring, and the farmer would be able to sow and

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plant in the proper time, and not be waiting for the sun to dry np the vast quantity of superfluous moisture accumulated in the soil for months, for want of drains and water furrows between the ridge There would be no waste by wide furrows, because the plough in finishing the furrow would loosen sufficient soil on each side to form a seed bed for the grain, and hence the furrow would be only one foot wide, instead of two or three feet as at present.

These are not impracticable improvements such as any farmer may adopt, with very little additional expenditure of labour or money; and these in provements must precede all others. Manure is little better than wasted if the land is not sufficiently drained and properly ploughed. From my own experience, I am persuaded that insufficient draining and defective ploughing is the main cause of deficient crops in Lower Canada It delays sowing and planting and the land is never in good condition either for sowing or for growing crops. The operation of plowing cannot be properly executed on land not sufficiently drained, though the plough may greatly contribute to draining the land, by its injudicious use in the manner I have described.

Green crops, and summer fallow, to the extent of at least one-third of the land kept under tillage, is considered essential to profitable farming in Britain, and how does this compare with the practice of a vast majority of our agriculturists in Lower Canada? Of summer fallow there is scarcely any, and the green crops, except in the neighborhood of our large towns, is not, perhaps, over two or three per cent of the land in tillage. Under these circumstances. how are we to expect that the land can be kept clean and in a profitable state of cultivation? The thing is impossible. If we had a large portion of our lands in good pasture and meadow it would be a good substitute for green crops, as it would be the means of keeping the land clean and in good condition; but our pastures and meadows are not very extensive or in that high state of improvement that would make them profitable, and always ready for cultivation. I do not of course include peas in my estimate of green crops not exceeding two or three per cent, because peas are not so carefully cultivated as they should be, and in numerous instances large quantities of weeds are allowed to grow in the crop and mature their seeds. Peas however are one of our best crops we can cultivate, the soil and climate being favorable for them; and they certainly are not so exhausting or injurious to the land as a succession of cereal crops. I introduce the subject of green crops and summer fallow to remind agriculturists how defective our system of husbandry is compared to that of Britain in this time of general progress and improvement; and it is absurd to expect favorable and profitable results from a defective system of agriculture.

There is a certain mode of cultivation and management required to be observed in order to obtain profitable returns from the soil; and if we neglect what is so manifestly our duty and interest to practice, we cannot expect anything but short crops and unprofitable farming. I know there are grave objections offered to the cultivation of green crops upon a large scale as being expensive, and that they could not be disposed of advantageously. To a reasonable extent they might be employed profitably in the feeding of cattle. But there can be no objection to summer fallow—an easy and certain mode of cleaning and improving the land; and when it is necessary to do so, farmers are not excusable for neglecting this practice while their land is producing half crops or less. No farmer that keeps live stock should neglect to cultivate carrots and mangold wurtzel in proportion to his stock of horses, cattle and sheep. Then he might feed some of his straw to his cattle by giving them a small quantity of roots daily; but without roots, straw alone is a poor food for cattle, and scarcely sufficient to keep them from starving. Carrots are excellent food for horses and a saving of oats and hay. 15 to 30 tons of carrots may be produced per acre on suitable soil, properly cultivated. There is no true friend to the country that will not regret to see land badly managed, and poor crops resulting, when there is no necessity it should be so. The soil is generally of excellent quality naturally, and when properly treated produces very good crops. We should not persist in sowing any species of grain that does not succeed with our time of sowing or mode of cultivation; but we should follow the practice of those who do succeed, with this particular grain, or discontinue to cultivate it, and substitute some other.

I have seen this year some very superior crops of wheat and some very poor ones indeed with the same climate and the same pest, the wheat fly common to all. There must be some cause for this, and is there a plainer duty than to endeavour to understand this cause, and strive to provide a remedy. It is a public and general loss, to have good land occupied, and labor and seed applied in its cultivation, in so defective a manner, that it does not yield remunerative returns, or such returns as would be quite possible to realise under more skilful and judicious management. With an industrious and intelligent

community, such a state of things should not be suffered to exist, when improvements in agriculture are making such rapid progress particularly in the country with which we are connected; and also, when we place encouragement by ample markets, and remunerating prices, for any surplus products we might have to dispose of.

I do not wish to be understood as saying that agriculture in Lower Canada is very much behind agriculture in Upper Canada, or in the United States. I only state that our agriculture requires, and is capable of vast and profitable improvement; and I cannot understand why we should put off these improvements, when we know what they are, and the necessity for them. I do not propose any wild and expensive speculation, but simple improvements easy to accomplish, and certain to remunerate amply, not only in cash, but in credit to agriculturists. There are advantages and disadvantages peculiar to Upper as well as to Lower Canada, and in order to prevent any disposition to make excuses for bad farming by imagining that Upper Canada is not suqject to disadvantages as well as we are, I beg to copy the following paragraph from an Agricultural Report, published in the *London Mark Lane Express* of the 8th October last:—

Northumberland, Newcastle District, C. W.
September 11, 1855.

A long and tedious harvest has at length been brought to a close We never knew the wheat harvest here extended over so long a period, or the grain ripen so slowly, as it has done this year. Many peculiarities too have attended the season and appearance of the crop, causing an ebb and flow of hope and fear, which renders the state of opinion as to the produce very various After taking every feature into consideration, our estimate, given in last report, of one-third deficiency in total produce below the average of the last two years, holds good throughout the district.

The fall wheat came on unusually slow with many heavy complaints of weevil, until the latter part of July, when it deadened off at once, apparently with rust, but a closer examination showed it to be a sort of mildew, which shrivelled the grain in a less degree than is usually found to be the effect of rust.

The bulk of straw was heavier than might have been anticipated, and considering the large breadths winter killed the produce may be expected to be fully larger than we thought. Spring wheat was extensively sown but exceedingly backward, and as to quality is so various as to range from a 40 bushel crop to literally nothing, on well prepared soils; many crops having been cut for fodder, chiefly owing to the ravages of the Hessian fly and weevil. We have seen considerable breadths never push up to ear, but wither away, the stems completely cut off by the worm of the Hessian fly; again very heavy looking crops, which have only 4 to 6 grains left in the lower part of the ear, the remainder eaten up by weevil. The external parts of the field, however, appear in this latter case to have been the worst; so that on cutting up. the crops were viewed more favorably. The weevil appears to be most destructive on the heaviest, the fly on the lightest soils. Our impression from local reports, and intercourse with many who travelled over various sections of the provinces, is, that the produce of western Canada must be far below the impression hitherto given by our public prints, even should the thrashing floor yield better than the little trial yet given leads us to expect.

From this report, if correct, we certainly have no right to think our situation, climate, or soil, very inferior to those of our friends in Upper Canada; and it would be very proper that the agriculturists of Lower Canada should be perfectly satisfied of these facts. If they should think otherwise, they will fancy it good ground to excuse themselves for any defects in the practice, or deficiency in the products of their agriculture.

They have the Hessian fly in addition to the wheat fly in Upper Canada and we are not troubled by the former insect. In the United States they do not cultivate green crops to any great extent: Indian corn is the staple crop, and is produced there in the greatest perfection; and I have no doubt it is the cheapest and best food they could employ for the feeding and fattening of stock. We however, cannot grow it in equal perfection, and therefore, green crops, which we can grow in perfection, will answer us better for feeding and fattening stock. The extensive cultivation and use of Indian corn in the United States, is the most marked difference between the agriculture of that country and that of Canada.

Fortunately, the soil and climate of Canada are as favorable for the production of green crops as those of the United States are for Indian Corn. These circumstances equalize the advantages peculiar to each country more than we are generally disposed to admit. So far as I am capable of judging I have no hesitation in saying that Lower Canada possesses advantages which makes her equal to any part of North America for agriculture. I know this assertion will create surprise, and doubt of its correctness, but I believe, nevertheless, it is capable of demonstration. Our

soil generally is not inferior to any I have seen in North America, and our climate is not unfavorable for the production of a variety of crops in perfection, because I have seen them in the greatest perfection With all these facts before us, why should we be second to any country in agriculture?

I met a gentleman lately, who has been for many years in the provision trade, between North America and the West Indies, and he told me that Canadian beef was considered lean and of inferior quality to the beef of the United States, and this I am disposed to believe, from the sort of cattle I have frequently seen slaughtered and packed in Montreal. He also said that flour from some States of the Union was superior to any from Canada, and he attributed this to the flour being dryer and closer packed, and said that the barrels were smaller in size by one-eighth than the Canadian barrels for the same weight of flour, and this he considered preserved the flour better, by excluding the air. I mention these circumstances without pretending to vouch for their correctness as regards flour. If there is any fault in the management of those matters, they should be remedied, and the character of our products maintained in every part of the world they may be sent to.

With regard to the character of Canadian flour in the West Indies, I may have been correctly informed. If the wheat is damp, or frozen, and made into flour in this state, without kiln drying, it would not keep well subquently. It is of great importance that this matter should be enquired into. the farmer is not so much to blame for the bad character of the flour, though the grower of wheat must suffer if the flour will not maintain a good character in foreign markets. Our country is and ought to be a produce country, and it is of the greatest importance to the producer that the character of the produce even after it passes out of the hands of the grower, should be maintained good. Wheat that is stacked out, unless carefully thatched, after the stacks are well made, is very liable to imbibe more or less moisture, and in that case the grain cannot be perfectly dry, and may become frozen. If this is a common occurrence, it is very probable the grain may not be perfectly dry when made into flour, and of course the flour cannot keep so well as if the grain was dry.

Is there any excuse for keeping cattle until they are two, three or four years old, and then selling them for beef, when there is no beef upon them that is fit for use? There cannot be more unprofitable farming than this; all the profit of breeding and rearing cattle is lost at the time they should yield ample remuneration for their keep. It is most absurd to rear stock two or three years, and then sell them in a lean state to be sold as beef for foreign market. This is the consequence of insufficient food in winter, and poor pastures in summer. If the farmer who has lean stock, have not pastures that are sufficiently good to make them fat, he should dispose of them to farmers who have good pastures to fatten them as in the old country.

This is the regular practice in the old country for extensive farmers with good old pastures, to purchase poor cattle at fairs, and fatten into good beef, and what is there to prevent the same practice here, and thus put an end to this most discreditable practice of slaughtering lean cattle for beef, that are actually only fit to be put to fatten? I was extensively engaged in this sort of farming as a grazier before I came to Canada, and I have no doubt it would answer well here, and be a vast benefit to the country. The manner in which our cattle are managed at present is a very great loss to the country, and I hope these remaks may induce some farmers who have means and opportunity to try the business of purchasing lean stock and fattening them for slaughter as good beef in the fall. We may not in a year be able to introduce this system because there may not be good pasture which can at once be applied to this purpose, but in a very short time it might be in full operation, and successfully carried out. The management of live stock is very defective in a large portion of Lower Canada. From the time of birth of the animal until their death, this mismanagement prevails, with the exception perhaps of horses. Male animals, whether required for breeding or not, are allowed to remain unchanged until nearly at maturity; no selections of the females of cattle or sheep are made for breeding; their feeding in winter and summer is deficient, and there are other defects that might be enumerated. Under such circumstances, it is impossible that stock can be profitable to their owners. Compare this management with that of the live stock in Britain, where they have the best stocks in the world from good management, and see the vast difference. I have always been an advocate for Canadian cows eve found them very profitable when selected of good quality, and properl how can the good qualities of any breed of animals be fairly ascertained unless managed properly, and sufficiently fed, with suitable food at all seasons of the year? I am sorry I cannot do more than bring the subject under notice. I must, however, conclude this communication.

WM. EVANS.

MANURE.

A sufficient supply of manure is most essential to the succesful cultivation of the soil, and in this country, Agriculturalists who are not in a situation to obtain manure from towns, should endeavour to have a supply upon their own farms, which is quite possible, by attention and proper management. If it should happen, however, that through neglect or from any other cause, a sufficient supply of manure, proportioned to the land in cultivation is not forthcoming, the extent of land under crop should be diminished, and that part for which there is no manure, be either summer fallowed, sown with a crop to be ploughed in as green manure, or let out to grass; and in no case should any regular crop be attempted to be grown, where the soil is not in a state of fertility to produce a fair average crop. There are many ways of increasing the manure upon almost every farm. Weeds, and other annual plants not eaten by stock, should be carefully collected and put to ferment and rot for manure. The high banks of drains, bog, or swamp earth, ashes—burned or charred earth—lime, salt, gypsum—and any wastes of manure that can be collected, should be mixed in a compost heap, which after it is thoroughly turned over with the spade, and subsequently allowed to heat and ferment, will make an excellent dressing for any crop. If there is any liquid manure to throw upon this compost heap occasionally, so much the better. Charred, and burned clay, applied alone, is found to be a very good fertilizer. There are abundant sources of manure, if we exércise due diligence in collecting them, and skill in their management and application. The sources of manure I have enumerated, may be considered as extra, to the supply obtainable from the farm-yard. I have in a former communication alluded to the wasteful management of manure which prevails to a great extent, and I cannot account for such waste, unless by supposing that farmers who mismanage their manure and do not employ it regularly consider its application to their crops as unnecessary. Within the last few years, however, many farmers who previously appeared to set very little value on manure, are now become acquainted with the necessity for applying it to their crops, and I hope manure will soon be more generally estimated at its full value for Agriculture. I have been constantly under the impression from the time of my arrival in this country that the first act of settlers in the forest of Canada is generally to rob the land of its natural manure, by cutting down the forest, perhaps the growth of many centuries, burning the wood, and then selling all the ashes they can collect to be converted into potash for exportation. This is the result of our first connection with the soil of Canada, to take all the manure we can from it, and sell it for a consideration, that is actually as nothing, compared to the value of the ashes to the land for a great many years to come. Parties may imagine that the land is sufficiently fertile after depriving it of its natural manure. I, however, beg leave to express my conviction that in taking off the ashes produced from the burning of the wood which previously covered the land, they deprive the soil of a better and more suitable manure than is ever again returned to it. The dense forests of large trees which cover this country in its natural state must have extracted an immense amount of nutriment from the soil, and to the depth that the roots of the trees have penetrated and if all this production of the soil is at once cut down—burned,—and the ashes sold off, it cannot fail to have an injurious effect upon the soil, and diminish its power of future production. The potash thus taken from the soil in large quantity is one of the most necessary, and useful ingredients for the production of crops, and it is said will not be replaced by the application of farm-yard manure. It is a well established fact, that when the soil does not contain sufficient ingredients required for the crop that is sown, it will be imperfect, and much more liable to disease—than if a sufficient supply of the necessary ingredients was present in the soil. The potatoe disease has been compared to the typhus fever, and the predisposing cause or causes of this fever are supposed to be the want of a sufficient supply of nutritive food for the people. The potatoe is always said to be predisposed to disease, from the want of food in the soil that is most suitable for its healthy structure. Soils of a certain quality, long in cultivation, become exhausted of potassa or potash, and this ingredient is essentially necessary to exist in the soil in order to produce a healthy crop of potatoes. I believe the potatoe disease has been more destructive on this continent than in any other country, and is said to have commenced first in North America; and the cause assigned for it was:—"That it was a matter of notoriety that the potassa has been extracted from the soil by timber, the timber burned, and the ashes or potassa exported." Is it not quite possible, that from these causes debility is produced in the potatoe, that predisposes it to disease, and this disease may be contagious? Dr. Kemp, in his "Vegetable Pathology" remarks "the disease is worst on wet soils, and in these, for an obvious reason, what little potassa there is, is with greater difficulty obtained by the plant. * * * So also on well cultivated land it is worst, for such land is peculiarly deficient in potassa, the cereal grains growing upon them carrying off so much of this alkali to towns. But in granitic vallies the disease is again checked, and it happens that the falspar of the granite which, when disintegrated, makes up a great part of such soils, is un-commonly rich in potassa. However in severely cropped land, and in gardens on these granitic soils, the disease again prevails, and we know that in both these cases, the potassa must have been very much diminished. The conclusion that may legitimately be come to, seems to be this—the existing cause of the potatoe diseases is an epidmemic influence, and perhaps also, a contagious miasm; and it attacks potatoe plants that are in a state of debility—this debility being caused by the potatoe having received, for a succession of years, a very imperfect supply of potassa, a substance which is to the potatoe an ingredient absolutely necessary to its healthy

structure. . . . . .

If the above conclusions are true, the remedy for the potatoe disease is the careful growing of the seed potatoes for many years in land where, besides the other ingredients of which they stand in need, they will have an ample supply of potassa." I do not pretend to say that Dr. Kemp gives a satisfactory explanation of the pototoe disease, but I do think it the most satisfactory attempt to account for the disease that I have yet seen. One thing is certain, that if we deprive the land of its natural manure, which we have found upon it, before we take any crops from it, we must diminish its fertility and its power of production, when we do bring it into cultivation. The late Professor Johnston, of Durham, England, who published some excellent works on agriculture, says in his Catechism of Agriculture, Chemistry and Geology: "When the soil becomes poorer and less productive, from bad management and constant cropping, it may be improved by ploughing in green crops, by growing clovers and other plants which have long roots in the soil, by restoring all the hay and straw to the land in the form of manure, by laying down in pastures, &c." Again: "If the *same kind* of cropping be carried on for a long time without a proper addition of manure, the land will become gradually less and less productive, because crops draw certain substances from the soil in great abundance, and after a number of years the soil cannot furnish these substances in sufficient quantity to the growing crop. The grain of our crops especially exhausts the soil of phosporic acid, of potash, and of magnesia: the roots of the potatoe chiefly exhaust it of potash, soda, lime, and phosphoric acid." I believe other root crops also, exhaust the soil of these latter ingredients. To remedy such special exhaustion, the catechism teaches us "to return to the soil the particular substances our crops have taken out. Every crop takes away from the soil a certain quantity of those substances which all plants require, and if we are always taking out and putting nothing in, it must at last become exhausted. On the contrary, if we put in the proper substances, in the proper quantity and at the proper times, we may keep up the fertility of the soil perhaps for ever. If we wish to keep our land in proper condition, we must put in at least as much as we take out, and if we wish to make the land better, we must put in more than we take out; but this can be done with profit because the manure that is put in, will not cost the skilful farmer, anything near so much, as the crops which he takes out will be worth." Such are the simple rules laid down in this excellent catechism, written by a gentleman well qualified to give practical instruction in the science and art of agriculture, and whose death, in the prime of life, I consider a great loss to agriculturists. I avail myself of such good authority as the late Professor Johnston, to strengthen the suggestions which I submit. Baron Liebig has lately published a little work, "The Principles of Agricultural Chemistry," which contains fifty propositions, being a summary of the true connection between Chemistry and Agriculture, and these propositions fully support the views of the late Professor Johnston on the same subject. I beg to copy a few of these propositions, which are well entitled to attention. Objections may be urged against Agricultural Chemistry, but the selections I make, are so self-evident, that agriculturists only require to be reminded of these, to admit their full force and reasonableness, and I hope they may produce some good effect from such well known and respectable authority:—

"The different substances necessary to the growth of a plant, or the different articles of their food, are *all of equal value*; that is to say, if one out of the whole number be absent, the plant will not thrive." "A soil is fertile for *a given kind* of plant when it contains the mineral food proper to that plant in due quantity, in just proportion, and in a form adapted to assimilation, or available for the plant." "The increase of fertility in a soil by fallowing and mechanical preparation, *if the mineral matters carried off in the crops be not restored to the soil*, produces, sooner or later, a permanent barrenness." "If the soil is to retain *permanently* its fertility, the mineral constituents removed in the crops must be restored to it from time to time, at shorter or longer intervals, or, in other words, the original composition of the soil must be restored." "Two plants, whose root fibres have an *equal* length and extent, do not thrive so well beside each other, or in succession, as two whose roots being of unequal length, received their food from different strata or depths of the soil. The more rapid a plant is developed in a certain time, the more food it requires in that time." "The *fertile* soil takes up from the air, in the plants grown on it, more carbonic acid and ammonia than the barren one; this absorption is in proportion to its fertility, and is only limited by the amount of carbonic acid and ammonia in the atmosphere. If, after a time, the soil is to recover its original fertility, the mineral substances extracted from it in a series of years, must be again restored to it. If the land, in the course of ten years, has yielded ten crops, without restoration of the mineral substances removed in those crops, then we must restore them in the eleventh year in a quantity ten-fold that of the annually removed amount, if the land is again to acquire the power of yielding a second time a similar series of crops. After a series of years, and a corresponding number of harvests, the fertility of the soil or field diminishes. While all the other conditions remain the same, the soil alone has not done so; it is no longer what it was at first. *The change which is found to have taken place in its composition is the probable cause of its diminished or lost fertility.* "*By means of solid and liquid manure, the lost or diminished fertility of the soil is restored.*" The foregoing "propostions" of Leibig are, I believe, generally correct; and assuming them to be so, we must admit that the system of husbandry which prevails in a considerable portion of the country is well calculated to diminish the fertility of the soil, and reduce it to comparative barrenness. His views confirm as well the

expediency of adopting a rotation of crops, as the necessity of maintaining the fertility of the soil. He also speaks of the effect of what is called the weathering, or action of the weather upon the soil, by the process of summer fallow; that carbonic acid and ammonia are conveyed to the soil by the rain and the air, and that the ammonia remains in the soil. He also says:—"It is a matter of undoubted and indubitable experience, that land, of whatever quality, does not retain its capacity of yielding good crops of the same plant for an infinite series of years; but that, at the end of a limited number of years, the plant no longer thrives on the same soil."

I beg most strongly to recommend the foregoing propositions to the attention of agriculturalists. They show in the plainest terms the necessity that exists for maintaining the fertility of the soil we cultivate by manure, if we desire that it shall produce good and remunerating crops. Let us only compare the system practiced in a large portion of this country with these propositions, and we shall at once be convinced of its numerous and injurious defects. It would be very discreditable for us to strive to excuse these defects, by allowing ourselves to suppose that we could not remedy them—I should never propose any remedy for the defects in our agriculture, if I was not convinced that remedy was practicable. What should prevent us Canadians from doing what would be manifestly for our advantage as well as the Agriculturalists of any other country? In a recent lecture of Professor Way, Chemist to the Royal English Agricultural Society, "he called attention to the large amount of ammonia taken up by the soil, and washed into the land by the rain; and to the great importance, consequently, of exposing the soil in such a manner to the atmospheric influences as may tend to this ammoniacal absorbtion. Fallowing land, he remarked, may give way to rotation of crops, but that there was no such thing as simple resting, as fallowing was supposed to imply in this case; for an alteration of the soil under the influence of oxygen was continually going on. Every interval, even between one crop and another, was in reality a fallow. Land should be laid as light as possible, for the purpose of its æration. The working of land, with a view of this abundant æration, was one important means of improvement. * * * The amazing amount of ammonia locked up in the land itself could not be taken up by plants, and would, therefore, remain in a form unavailable for vegetation, unless the management of the soil tended to release such manuring matter, and bring it within reach of the roots. He had calculated, from data furnished from some rich loamy land of tertiary drift, that the soil within available depth, contained ammonia at the rate of one ton (equal to six tons of guano) per acre. This was a stock of wealth which would repay the most active measures being taken for its release and distribution." I introduce this extract from the lecture of Professor Way, to show how much at variance with his proposition is the practice in Lower Canada, in numerous instances, of leaving half the arable land waste every alternate year, neither ploughed nor sown with any kind of seed. Green-manuring is a means of improvement almost in the power of every farmer,—if he cannot procure sufficient manure in any other way. If it were possible, the land should be ploughed in the Fall, and after the Sp .g work was finished, the portion proposed for green-manuring might be sown with seed that would produce plants of rapid growth and would cover the ground well. The plants usually sown for this purpose in England, are tares, clover and rape. In this country we might sow tares, rape, buckwheat, or I. corn, and all these would be of rapid growth in our climate, and would give a large produce for ploughing in, as manure, which should be ploughed down before the plants begin to form seeds, or even before they flower. The "Farmers' Note Book" says on this subject, "Every plant draws the most of its organic elements from the atmosphere and water, and all its inorganic or mineral, and the rest of its organic elements from the soil. If, therefore, the plant be ploughed into the soil on which it grew, as none of the mineral elements are lost during its growth, not only are all of them returned to the soil, but a great part of the organic constituents derived from the atmosphere. * * * It is important, then, for a farmer wishing to practice green-manuring, to plough down the plant at that stage of its growth when it is found to be richest in organic matter, which is just before the blossom has been fully expanded." Professor Way says:—"If, instead of having the land exposed only to the action of the atmosphere, we crop it with a plant whose roots run in every direction for food; and if, when this plant has arrived at considerable growth, we turn it into the surface soil, we have not only enriched the latter by the elements derived from the air, but also by matters both mineral and vegetable fetched up from the subsoil. The plant thus acts the part of collecting the nourishment for a future crop, in a way that no mechanical subsoiling or trenching could effect." The straw which farmers often sell in our Market at a very low price, would make excellent manure simply ploughed into strong clay soil, and pay the farmer much better than the price he sells it for in the Market. With skill, care, and industry, every farmer may be able to keep up the fertility of his land. To expect that its fertility can be maintained by the present system extensively practiced in Lower Canada, and which I have endeavoured faithfully to describe, is out of the question. If we desire in earnest to improve our agriculture, and make it profitable to ourselves and advantageous to the country generally, we must be-stir ourselves, and endeavour at once to remedy the defects which we are convinced do exist. Agriculturalists, I know, are not fond of uncertain experiments, but in this time of general movement, they alone are not to stand still with folded arms, and decline to advance, though the prospect before them was of the most encouraging nature.

In England they mix salt or gypsum with

guano, in order to prevent the great waste of ammonia which takes place on exposing guano to the air, and which these substances are found to prevent. The quantity recommended is 50 per cent of salt, and if gypsum is made use of instead of salt: the same proportion might be adopted, or even an equal quantity of gypsum might be mixed with guano. Two cwt. of this mixture would make a good top dressing to young grain, when three or four inches over ground; but should always be applied in moist weather, or immediately before rain, otherwise it will not produce much improvement in the crop, when applied in dry weather. If salt or gypsum cannot be had, wood ashes should be mixed with the guano in the proportion of two or three parts ashes to one of guano. The quantity of guano applied as top-dressing to young grain should not exceed from one to two cwt. per acre Wood-ashes, that are so constantly sold by farmers for making soap or pot-ash, are one of the most valuable manures upon the farm for almost every species of crop, and this is sold for a trifle. Salt and lime, mixed in the proportion of one bushel of salt to three or four of lime, is an excellent application as top-dressing on land under grass, or for any cultivated crop, applied to the soil at the time of sowing or planting at the rate of from twenty to forty bushels to the acre. The mixture will be better for being mixed in the winter in a shed or under cover, and turned over two or three times if possible before it is made use of in the spring Salt is not so much employed in agriculture in Canada as it should be, where we are at such a distance from the sea.

I have seen a paper, copied from the Journal of the Royal English Agricultural Society, on the subject of "Covered Farm Shadings," contributed by Lord Kinnaird, which is entitled to attention. Lord Kinnaird says:— "A shading entirely covered in, effects a great saving in farm produce, which must otherwise be *exposed* to the injurious effects of the weather while the amount consumed and destroyed by the stock is considerably less; but the most remarkable result of my experience is in the value of the manure." His Lordship goes on to describe his experiment at some length, and very minutely. There were two lots of cattle kept, of the same number, age, and description—fed alike, and having the same quantity of litter daily. The manure from one that was kept in an open uncovered yard---and that from the other lot, kept in a covered yard was as follows: "During the winter of 1850-'1, the manure in the open yard was carted to the field selected for the experiment, and put in one large heap of 200 loads, well pressed down by the carts driving over it when emptying, and then covered over top and sides with earth and road scrapings. It lay thus till a week before using, when it got a turn over in the usual way. The dung in the covered yard that had been allowed to collect all winter, was carted direct to the field, and put into the drills, without any turnings, being quite well enough made for the crops intended." The experiment was made upon a 20 acre field. There were 20 cart loads of manure put to each acre, and the whole field planted with the same kind of potatoes, and at the same period, the begining of April. The field was of equal quality, and 10 acres, had the manure from the covered yard, and the other 10 acres, the manure from the heap in the field, from the uncovered yard. The crop was taken up from the 1st to the 4th October, after two seperate portions in each part had been carefully measured and weighed, the result being as follows:—

Uncovered Dung.

1st measurement, 1 acre produced 7 tons 6 cwt. 8 lbs. potatoes.

2nd measurement, 1 acre produced 7 tons 18 cwt. 99 lbs. potatoes.

Covered Dung.

1st measurement, 1 acre produced 11 tons 17 cwt. 25 lbs. potatoes.

2nd measurement, 1 acre produced 11 tons 12 cwt. 26 lbs. potatoes.

As soon as the land could be cleared and prepared, each lot was sown separately with wheat in drills, from 22nd to 25th October. In spring the whole field got a dressing of 3 cwt. of guano per acre. The whole field was cut on the 26th August, 1852, the portion manured by the uncovered dung being at least 4 days earlier than the other. As before, the two separate portions in each half of the field were measured, cut, and stocked separately; on the 4th September each portion was thrashed, the grain carefully measured, and the straw weighed. The following was the result:—

Wheat on Uncovered Dung.

Acre.	Produce of Grain. Bush.	Weight p bu. lbs.	lbs.	Produce in Straw Stones	lbs.
1st.	41	19	61¼	152	22
2nd.	42	33	61¼	160	—

Wheat on Covered Dung.

Acre.	Produce of Grain. Bush.	Weight p bu. lbs.	lbs.	Produce in Straw Stones	lbs.
1st.	55	5	61	220	22
2nd.	52	47	71	210	—

The above results would offer sufficient encouragement to adopt the plan of covered yards, where there would be means of doing so. Lord Kinnaird feeds his cattle in boxes, and this plan he also recommends. I have no doubt whatever that it would be an advantageous plan to cover our farm yards in Canada. It would not be so expensive as parties may imagine. The roofs might be flat and covered with this Asphalte Roofing Felt, that is now being extensively used here. The objection to flat roofs is the fear that snow would collect upon them; but I am satisfied this might be prevented by constructing them properly, so as to allow the wind to have a free course over them. Covered yards would be much more necessary here than in Britain, and would be a great benefit as a shelter to the stock, as well as the manure. In our open yards, it is impossible to prevent the snow from mixing with the manure, and this, with frost, rain, &c., cannot fail to deteriorate the yard manure, as it is generally kept in Canada. Lord Kinnaird had the dung carted to the

field, as we generally do here, but he secured it in a better manner than is usual with us to do, and still the difference in the results obtained from the application of covered and uncovered dung, extending to the crops for two years, is most remarkable, equal to over 30 per cent. in potatoes the first crop, and 25 per cent in wheat the succeeding crop. The dung kept in a covered yard, safe from frost, snow, and rain, until carted out to the field in spring and applied directly to the crop, must retain more of the useful gasses, and be in a better and more fertilizing state, than dung exposed in open yards or in the fields all winter. No doubt it is a considerable advantage to have the dung carried to the fields here during winter, ready for use on the spot, in spring, when we are so hurried in that short season, and I believe that it is fully as safe, and free from deterioration in the fields, as in open yards, in the usual way with us. But this experiment of Lord Kinnaird proves beyond a doubt, the advantage of keeping the dung in covered yards until required for use for the crop. The experiment has been carefully made, and I would strongly recommend the subject to the attention of agriculturalists. Though the whole farm yard should not be covered there might be a part sufficient to cover the manure.

There is a vast improvement in the implements of our agriculture, inviting us by their excellent adaptation, lightness, and beautiful forms, to make use of them. Our progenitors had no such implements to use, but theirs' were as heavy, clumsy, and unsuitable, according to our present ideas, as the works they were employed in, were imperfectly executed. When I see the present beautiful impliments of agriculture I regret that I was not so favoured in my younger days as to have such implements for my own use, and the use of those I employed. The implements of the present day are of immence importance to the progress of agricultural improvement, and are calculated greatly to facilitate all the operations of agriculture. Agriculturalists owe more to the inventors and makers of agricultural implements, than they are always disposed to acknowledge.

TREES.

There is one more defect connected with the management of land in Canada, which I must not omit,—that, is, the almost total destruction, when clearing land, of every tree that grows upon it, and the general neglect to plant any other trees, either for shelter or ornament, or for the use of the farm. I have frequently endeavored to attract attention to this subject, in order that some steps might be taken to prevent or check this evil, but the destruction still goes on, as if it was desirable that we should not leave a vestige of the fine forest trees that covered the lands of Canada, or plant any others in their place. The total destruction of trees where settlements are being made is attempted to be justified, in consequence of the difficulty of preserving trees when clearing land, and it is urged also that the trees that are left interfere with the cultivation of the soil. There may be some foundation for these objections; but I think it would be quite possible to overcome them, so far as preserving some of the trees, by selecting those that have the deepest roots in the soil, in situations where they are not so much crowded, removing all the underwood, and thinning the large trees out to a certain extent. There may be trouble in saving the trees when the fire goes over the land, but nevertheless some may be preserved from injury. More trees might be left than would be necessary, and then if some were injured by the fire, a sufficient number might remain safe. The best varieties to leave as scattered trees, for shelter, ornament, and for use, are the elm, birch, beech, maple, hickory, ash, butternut, and perhaps the oak. Soft wood trees, if preserved, must be left in clumps, or groves, as they will not stand alone, if of large size. The cedar, or pine species, left in clumps or groves, are very ornamental in the landscape, and may pay well for the land they occupy. If circumstances should not admit the preservation of some of the original trees of the forest, when clearing land for cultivation, trees should be planted at once, and I have no doubt they would pay for the land they occupy. Young trees of thriving appearance may be taken from the forest, and, if carefully planted, they will grow very rapidly. There is an advantage in planting—that the trees may be placed in the most eligible situations, where they will answer the best purpose, and be of the least injury. On an average, one hundred square yards would be amply sufficient space to estimate for each tree, until they would attain the age of thirty or forty years; hence, the use of only one acre of land would be lost for thirty-six trees, and if these trees were of a useful description, they would, perhaps, pay as well, when at a good size, for the land they occupied, as any other portion of the land, besides the shelter and ornament they afforded for so many years. They might, if cut down for any purpose occasionally, be replaced by planting other trees. I have seen trees planted alone in good soil attain a very considerable size in thirty years. In Britain, trees are planted for profit, and were considered to pay well for the land, if parties could only wait to allow them to attain a good size. But, apart from all consideration of actual profit, the rural population have an interest in maintaining the beauty of the landscape, and it is impossible to do so without a due proportion of trees. The long, straight lines of dead wooden fences, and the absence of a due proportion of trees, is a great disfigurement to the landscape in Lower Canada. Trees of almost every variety were the natural growth or production of this country, from the lowest valley to the summit of the highest mountains, and I feel persuaded that it must have an injurious tendency to strip the land at once of all these trees, particularly where the summers are so hot, and the winters so cold. There is no doubt that the destruction of the trees in other countries has been found to be very injurious generally, and I

fear it will have the same effect here, if we go on cutting down every tree, and not planting any. In many parts of L. Canada, where there is not a tree left standing, I have no hesitation in saying that the land suffers in consequence, and also the live stock pastured in Summer upon this naked and unsheltered land. I do not advocate too much shelter upon our arable land, because I believe it would be injurious to our crops of grain, but to a reasonable extent, trees and shelter judiciously provided, are absolutely necessary in Canada. In the Mother Country, live fences and trees prevail so much in some situations, that agriculturalists complain that they are injurious, but chiefly in consequence of their being a protection to game. In this country shelter is more necessary, and we have not the trespass of game to apprehend. Doubtless, we cannot have the land which immediately surrounds a large tree very productive of either grass, grain, or vegetables, but if all the remainder of the farm is well cultivated, except that part occupied by beautiful trees, left for shelter and ornament, we might very well afford to forego the crop that would be produced where these trees stand. I believe I am perfectly justified in stating, that a farm of two hundred acres, with a sufficient number of trees, judiciously placed, for shelter and ornament, would be more productive of grass, grain, and vegetables, for man and his live stock, than the same farm would be, if it had not a tree upon it. It may be very desirable to subdue the forests, and settle the country with industrious inhabitants, but the utter destruction of all the trees is not necessary to the accomplishment of this object. On the contrary, this object may be better attained by preserving some of the forest, or by planting other trees to the necessary extent, in place of those we cut down and destroy. This subject is of sufficient importance to entitle it to the serious attention of our Legislators. There is already sufficient proof of the injurious effects produced by depriving the land of every tree that grew upon it. It is better to inquire into the subject in time, while a remedy is in our power, than to wait until the matter is forced upon our attention by the manifest deterioration of the land in consequence of the destruction of the forest, and the want of trees and shelter. Any observing person, making a tour in the country in summer, will have noticed how animals appear to enjoy the shelter of a large tree during the heat of the day, if they are so fortunate as to have a tree growing in their pasture. It is also worthy of observation, how greatly animals appear to suffer in the heat of summer, in exposed, unsheltered pastures, where there is not a tree or shrub growing, and in such situations, there is seldom much grass for the stock. The country was amply furnished with beautiful trees, in all possible varieties, when we took possession of it, and with our boasted civilization, our first connection with the forest is to destroy it,—in fact,—we declare war by the axe, and the fire against every tree of it. In other countries, the most unmistakeable mark of education and civilization is to have a due proportion of trees in every variety, with hedges, shrubs, &c., and the absence of trees, and beautiful hedges, was the most certain indication of ignorance, poverty, and if not poverty, of bad taste, or want of a due appreciation of the useful and the beautiful. Probably many parties may object to my proposition in regard to the great advantages of a due proportion of trees on every farm for shelter, ornament, and other useful purposes. I however, would be delighted to have the matter fairly and thoroughly tested, in order that if trees are proved to be advantageous, as shelter for our land, our live stock, and for other purposes, measures may be adopted to prevent the utter destruction of our native forests, without providing for their necessary shelter, &c., by the planting trees regularly to a certain extent. A country without trees, reminds me of the descriptions I have read of the deserts of Arabia, or the frozen regions near the North Pole. It may be replied to my remarks, that the country is not so utterly denuded of trees as to justify my observations on the subject. In taking a general view of the country, trees and the original forest are seldom out of our vision; but at the same time you see numerous farms without a tree or shrub growing upon them. It is not of much advantage to these naked farms, or to the cattle pasturing upon them, that the forest may be within a mile of them, and that one or more trees may be growing upon a farm not far off. I am anxious to show that trees are necessary upon every farm, and if they are not growing there naturally, they should be planted with as little delay as possible. It has often been my chance to see a beautiful tree growing in a cleared field, where, perhaps, it was the only one upon the farm, cut down, for no other object, but the use of the wood for fire. It is very proper to cut down trees when we require them for use, provided we can spare them, or that we plant others in their place; but to cut down an ornamental tree, that affords shelter to our cattle in the extreme heat of summer, is, to say the least of it, very inconsistent, with regard for our own interest, for the comfort of our cattle, or any idea of what is necessary to constitute a beautiful landscape. Any attempt to interfere with the right of parties to do as they please in the management of their own property may be considered objectionable, and if a settler wishes to destroy all the forest trees upon his lot, without planting any others, he may suppose it would be very unjust to prevent him doing the first, or oblige him to do the latter, if he was not so disposed. I will not presume to offer any opinion on this subject. My object is to endeavor to show the injurious effects of destroying all the forest trees, without planting fruit or other trees, where they might be necessary for shelter, ornament, or other useful purposes. It is in our power to ascertain, by inquiry and investigation, what would be the probable result to the soil, and perhaps to the climate, by the total destruction of the forest in the country that is being settled and cultivated. I have read many reports of the injurious effects produced in other countries by the destruction of the forest, and the want of trees, and

it appears only reasonable, that to strip the country we settle, at once of the whole of the natural production that covered it, may produce a very great change, though we may not be able to comprehend perfectly why it should have this effect. In countries having a humid climate, and not subject to the same degree of heat in summer as this is, the want of trees would not be so injuriously felt as in Canada. It is, therefore of general importance that this matter should be enquired into, and if trees are considered to have a beneficial influence, that means should be adopted to preserve them in due proportion, or that other trees should be planted. In the British Isles, landed proprietors are sure to plant trees and provide for their protection to a sufficient extent, and when woods are cut down, others are planted. If we continue to go on cutting down the forests here, as we have done up to this time, we shall not in a few years have a tree left in the settled parts of the country, either for ornament, shelter, or for necessary purposes. I believe the Legislature have passed an Act for the protection of game in this country; but perhaps where there is so much of Canada still covered with forest, it may not be thought necessary to adopt any measures for saving a portion from the axe and the fire of the settler, as the work of settlement proceeds. The sooner every tree and shrub that grows upon a settler's lot of land is cut down, burned, and the ashes converted into potash and sold, the more successful he considers himself. There is not a farm that should not have some reserved wood upon it for necessary purposes that are constantly recurring, and if some of the original forest is not preserved, other trees should be planted regularly that would supply these demands, and answer for shelter and ornament, and be of general use to the country. Fine trees, in full leaf, are considered by most people to be beautiful objects, and notwithstanding this fact, it appears a most inconsistent proceeding, that we should destroy them all. Of course it is necessary for the settlement of the country that a large proportion of the forest should be cut down, in order that the land should be cultivated for the support of settlers; but as we have land in such abundance there is no necessity to destroy all the forest as we occupy it for settlement, we should spare a portion, if it was for no other purpose than to indicate the original state in which we received it for the occupation and support of our race.

AGRICULTURE OF LOWER CANADA.

On resuming my promised Review of the Agriculture of Lower Canada, it may be proper to observe that alluding in my first communication to the export of beef and flour from this country, it was only as the general produce of Canada, and not as belonging to Lower Canada in particular. I believe there is very little flour exported from the latter section of the Province, and with regard to beef, a considerable portion of what is slaughtered in Lower Canada is not raised or fed there, and, therefore, she does not deserve the credit of having fed all the lean beef that may appear in her shambles, or that may be exported from her ports. In whatever country lean cattle are slaughtered for Beef, it is a certain indication of the backward state of agriculture, and the absence of skill and good management in agriculturists. It is impossible that cattle can be profitably kept unless they are constantly improving while young, and when at the proper age to yield some return, they must either be breeding, giving milk, working, or fattening for beef. There is no standing still, or they will not yield remuneration for the food they consume. The farmer who does not bring his cattle to that perfection which they are capable of attaining, had better not keep any except for milk for his family. Oxen or heifers not breeding, should be brought to as great a degree of perfection as the animals are capable of, before they are slaughtered for beef, or the profit the farmer should have by them, is lost. From my own experience of this country, and the present state of agriculture, I am convinced that it is impossible for a large majority of farmers to bring their cattle to the required degree of perfection, without a total change in their system of husbandry, and unless we endeavour to find some remedy, the evil will still continue, of sacrificing one-half of the cattle of the country for want of managing them properly. Cattle cannot be brought to pefection without good and sufficient pastures, unless they are stall-fed; and where can we have good pastures under the prevailing system of husbandry. Pastures will not be fit to fatten cattle unless they are properly laid down and suffered to remain in grass for several years. In a country like this, the summer fattening of cattle will be found the most suitable and profitable, for selling them off in the fall for slaughter, for packing, for the shambles, and to parties who might purchase them for stall-feeding, which should be a separate business. Cattle will never fatten properly if mixed up with other stock as at present, cows, heifers, oxen, horses and sheep all pastured together. Oxen should be kept separate from cows and heifers, when fattening, and each required to be kept as quiet and undisturbed as possible. It is out of the power of ordinary farmers to seperate and manage stock in this fashion; therefore some other means must be found for fattening cattle, or we cannot greatly improve our present system.

The only remedy I see possible, is to adopt

the same system of fattening that is followed so successfully in the British Isles. We should have grazing farms, and fairs and markets established for the sale of cattle in the commencement of summer. At these fairs and markets the owners of these grazing farms might purchase dry cattle from farmers who would not have the means to fatten them. If this plan was commenced and in operation, it would put an end to the sale and slaughter of lean cattle for beef, because the grazier could afford to pay from five to twenty per cent (in proportion to their suitableness and thriving appearance) for cattle more than any butcher could afford to pay, who would have to sell them by the pound, and therefore he must purchase them at their estimated weight in beef, hide and tallow, and give nothing for their particular breed, or promise of future excellence. Farmers who would be obliged to dispose of lean stock, if they were of good breed or thrifty appearance, would obtain a much better price for them from a grazier than from a butcher. I have no doubt that by this plan the value of our cattle might be doubled, and that the character of our beef would be good in any country to which it might be exported. Some of our cattle may be of small size, but if this is an objection, it is quite possible to increase their size by careful selection for breeding, and by feeding the animals better from their birth. But even in in their present state, if the proper means were adopted, we might have excellent beef, fit for any purpose, though it might be small. I do not recommend any particular breed of cattle, but that each should choose for himself that breed which he may think most suitable for his pastures and other circumstances.

We certainly have not such excellent and extensive old pastures as they have in England and Ireland, but we have lands of good natural quality; and if we allow them to repose under grass for a few years, they will be excellent pastures. In this climate, pastures that have no shelter are liable to suffer from the heat and drought which frequently occurs in the months of August and September, but the skilful farmer might make provision to meet this difficulty, by having artificial food for his stock at that time. This may be readily accomplished where vegetation makes such rapid progress in our summers. Indian corn sown broad-cast, vetches, or tares and many other plants might be grown to supply any deficiency in pasture, where cattle would be fattening, and thus keep them in thriving condition. An experienced grazier might make a very respectable and profitable business. This plan of grass feeding cattle in summer need not prevent any farmer that has the means of stall feeding cattle in winter. All we require is,—to put a stop to the slaughtering of lean cattle for beef; and I am convinced it never can be put a stop to without a change in our management something similar to what I suggest. It would not be possible in a short review to give all the particulars connected with a system that is not known or practised here to any extent. If it was only in operation upon a limited scale, it would soon recommend itself for general adoption. It is to no good purpose that we should know and lament that our stock are not so good or our farming so profitable as we would wish, if we do not make an effort to introduce the changes manifestly required to make them so. We cannot disguise the fact that a large portion of our cattle are so inadequately fed in winter that it requires a good part of the summer to recover them, and put them in moderate condition; and pastures are frequently so poor that they will not even do this. Can anything but loss result from such management? I bring this subject forward in the most forcible terms I can, in order to show the necessity which exists for introducing a thorough change. If any explanation is required of the plan I propose, I shall be most happy to give any in my power. Though good pastures may not be general, there are a great many farms that have land under grass that would be excellent pastures at once. I would not, however, recommend any but skilful and experienced farmers to undertake the business of graziers, as both are necessary to ensure success. Fairs and markets in the months of May and June, for the sale of dry cattle, would act as an encouragement to farmers to have their stock of a good quality, and in good condition, so as to ensure a good price from the grazier; and this would be no small advantage of this new plan. I have no object in suggesting these changes, but because I know them to be required, and believe that it would be the interest of farmers, and the country generally, that they should be adopted as soon as possible. This country has a high character, and visitors will be sure to come to us from all parts of the civilized world. How desirable it would be that strangers should see that we were entitled to a high character as agriculturists when travelling through the country—that our fine lands were well cultivated, bearing luxuriant crops of every variety, and our pastures stocked with fine cattle, and abundance of food for them—every variety of animals in the right place, and having the right place for them, to insure

their thriving and good condition. Our country is an agricultural country, and I would prefer that we should show proofs of our skill in agriculture, to any other business we could be engaged in—as agriculture is the business of the vast majority of the people.

NEAT CATTLE.

In treating of Neat Cattle, I did not propose that we should put away all our present stock, and procure at once larger and more favorite breeds. I only recommended that the cattle we have shall be properly managed, and be well kept, so as to bring them to as great a degrée of perfection as they are capable of attaining. I have been always opposed to hasty and sweeping changes, as they seldom succeed, because they are not sufficiently understood to be carried out in a proper manner. When we acquire the art of managing cattle in a judicious manner, we shall be better qualified to judge of the defects of the perfections of different breeds, and be able to decide what description of cattlle will be the most suitable and profitable for us; and changes may be introduced gradually when we perfectly understand what they should be. It will be more prudent to practice a new system of feeding and management, to ascertain its effects upon the cattle we are accustomed to, than to introduce other breeds of stock, and subject them to the feeding and management that has not succeeded with the cattle we have. Small sized cattle will be sure to improve on good food, and under proper management; but to subject large cattle to bad pastures and insufficient food in winter, would reduce them to a worthless condition. This is the result to be apprehended from the introduction of larger breeds of cattle until the improvement of agriculture is more generally advanced. There cannot be any objection to a farmer keeping cattle of any size, however large, provided he brings them to the greatest degree of perfection they are capable of. There certainly is a great difference in qualities of different breeds of animals; but whatever breed is cultivated, they must be improved to the uttermost of which they are capable, or they cannot be profitable. I do not mean that cattle should be fed in the stalls fo two or three years, to bring them to this great perfection, but that they should be fed in the regular way that practical farmers adopt in feeding cattle. It may be very well to feed one animal of a particular breed until it becomes nearly all fat and tallow; but this is only an experiment to ascertain what an animal may be brought to, and cannot, and ought not to come into general practice. There is no necessity to make animals over fat, nor can it be profitable for the farmers to do so, or for the consumers of meat to purchase that which is over fat, or fat in extreme. The proper management of our neat cattle is a matter of very great importance to the farmers of Lower Canada, and would make an immense difference in the profits derived from their farms. If any proof was necessary that the summer fattening of cattle and sheep is not much practised here, I may state that there was scarcely any competition for the premiums offered at the three last annual Provincial Exhibitions, in the classes of fat cattle, and fat sheep, and not even sufficient competitors to take the premiums offered. This circumstance struck me as very extraordinary to have occurred at the last exhibition at Sherbrooke, in the midst of the eastern Townships, so well adapted for pastures, and for the raising and fattening of cattle and sheep It is true farmers might have such stock, and not show them; but these Exhibitions are established for the express purpose of showing the products of the country, and the progress which agricultural improvement is making, for the liberal grants by the Legislature for its encouragement.

With regard to sheep, it is satisfactory to be able to state, that we have a large number of excellent sheep now in Lower Canada, chiefly of the Leicester breed, and crosses with native Canadian sheep. This class of animals increase so rapidly under good management and suitable food, that there cannot be any difficulty in the improvement of this useful stock, if farmers will only adopt the means that are in their power. There is, however, a material change necessary in their management to make them as profitable as they might be to their owners. Confinement to small pastures in summer is not in accordance with the nature of the sheep, and on the general average of farms, the pastures are very limited in extent, and together with this disadvantage, sheep are very frequently encumbered with wooden yokes on their necks to confine them to these pasture, that are, in many case not sufficient to feed them. There is not any farm stock that will suffer more by this sort of confinement than sheep, particularly if of any other breed than the pure Leicester. This breed, as they are kept in the old country, always in fine condition,are not fond of rambling, because their legs are short and they are too fat to leap high fences.

The shelter and quality of the food in winter is also defective, particularly for breeding ewes. This, I believe to be the cause of a very small return in lambs, in proportion to

the ewes kept. Breeding ewes, in the lambing season, should be kept separate from other sheep, and carefully fed with nutritious food, (of which a part should be grain) and constantly attended to. In England and Ireland, they consider it very unsuccesful sheep-breeding. if they do not raise at least one lamb to every breeding ewe they keep, and in some instances, they have from 50 to 75 per cent over one lamb to each. Now, if we compare sheep-breeding in England and Ireland, with that in Canada we may understand the vast deficiency and loss resulting from our management. Another defect with us, is, allowing the male lambs to remain unchanged until nearly full grown. In Britain this operation takes place when the lambs are about a month or five weeks old, on all males not kept for breeding, and we should adopt the same plan if we desire to have good mutton, and our mutton, and our sheep thrive, pastured together as they generally are: all sexes and ages, and at all seasons of the year. The different ages and sexes cannot conveniently be kept separated here as they invariably are in a well managed flock of sheep in the old country, and they never will thrive properly unless they are kept separated when necessary. If we, therefore, determine to keep sheep and make them profitable, we should do all in our power to conform to the most approved system of sheep-management, and if we do not, we shall not find them profitable stock; no matter what breeds we keep. It may be replied, that notwithstanding all my objections, we have very good, well flavoured mutton and lamb in our markets, and I admit the fact. Our mutton, and lamb, particularly, when properly fattened, is equal, if not superior in taste and flavour, to any I have ever seen; but I regret to say that a large portion both of the mutton and lamb is not sufficiently fat to be deserving this character. Our wether mutton here, is not often kept to the proper age to be of the best quality, though I think they would pay well if properly kept to two years, or between two and three years old. Indeed we never considered them good mutton in the old country until over two years old, because they had not attained full size until then, and particular parties thought mutton not very good until after wethers had attained three years old at least, and the nobility and gentry, generally kept them until that age for their own use. No doubt wether mutton cannot be of the best quality until the animal has come to the full size, but they are seldom allowed to come to their due perfection in Canada. It may be desirable that animals should come to early maturity, but it is very questionable if sheep can be brought to maturity or perfection before they are fully two years old or perhaps three years old. They may be made very fat, and a great weight, but the flesh may not have attained the perfection it is capable of at a more advanced age notwithstanding.

The Leicester breed of sheep is very much esteemed in England for their early maturity, but still I do not think their mutton so good when under two years old, as when they exceed that age. There is not perhaps, any breed of sheep that will be found to succeed better than the Leicester when under judicious management, but I do not think the pure Leicester most suitable breeds for farmers who do not keep them, as this variety of sheep have been kept, to bring them to the great perfection they have obtained. A cross with a Leicester ram and Canadian ewes has produced a good, hardy and profitable description of sheep, and this will be the best plan of improvement to adopt under preasent circumstances.

There are not many of the South Down breed of sheep in Lower Canada, and the few we have are not of first quality. I saw at the great Exhibition at Boston last October, some South Downs imported by Col. Morris of the State of New York, the best I have ever seen. I think I may venture to say they were faultless, in regard both to perfection of form, and having a heavy fleece of excellent wool. These sheep are known in England as an improved variety of the South Down, and I think they would answer well in Lower Canada. No doubt a cross between them and the Leicester, or the Canadian sheep would produce very useful sheep, both in carcase and in wool.

The Cheviot breed of sheep is favorably spoken of, and from the description I have read of them, they might be very suitable for this country; but I have never seen any of the breed, and therefore cannot speak of them from experience.

What are known as the French or Spanish Merino sheep, are not favorite breeds with me, though the wool they produce may be very valuable. I think them also a tender stock, and not well adapted to our climate. They certainly have not any beauty of form to recommend them, and they never appear to me to be in good condition, or fat, like other breeds of sheep. I have never kept any of the breed, and therefore cannot say from personal experience whether they are profitable or not. The question for the farmer is, will

the fleece of the Merino sheep make up for the deficiency of the value of the carcase? I certainly have seen a good kind of sheep produced from a cross between a Merino ram and Leicester ewes. I would, however, prefer the Leicester and South Down, and crosses between them, and between each of them and our native Canadian sheep.

As I before observed, the improvement of our sheep is quite in our own power, and every farmer may be assured that whatever breed of sheep he cultivates, they will increase in number and produce wool mutton, in proportion to the care and good management bestowed upon them—in feeding them properly in summer and winter, and providing them with the necessary shelter. In England and Ireland, where there are only a few sheep kept on a farm, they scarcely ever attempt to fatten them, but the wether hoggets and dry sheep are sold to graziers, as in the case of neat cattle, who keep them to maturity and fatten them. This plan would be certainly the best here also; but it would not be easy to persuade farmers to adopt this plan, as they are in the habit of manufacturing the wool—a very commendable practice, and one I would be sorry to see discontinued. The farmers, however, might keep sheep to give them sufficient wool, but if they have not the means or opportunity to fatten the wethers, and old sheep, it would be much better to sell them to graziers, who would be able to fatten them properly. There must be a thorough change in the management of our sheep, as well as in our neat cattle, or they will not remunerate for their keeping. The profit derived from neat cattle and sheep should be a very large item in the general products of agriculture in Lower Canada, and it must be the farmer 's own fault if it is not so.

I have been writing on the subject of agricultural improvement for more than a quarter of a century, and I cannot but ask myself, what good has it all produced, or what benefit will any of my future communications produce? I see great defects in our agricultural system, and it appears as if I could not forego any opportunity of pointing out these defects, and suggesting such improvements as, in my humble judgment, would be advantageous. If agriculturists do not approve of my suggestions and will not adopt them, I must only conclude they have good reasons for rejecting them.

SWINE.

The management of swine in Lower Canada is not liable to much objection. Perhaps in no country is there better pork, and this I attribute to fattening with peas and bruised grain. The breed of swine in general is far from being a profitable variety; they are of very objectionable form, and difficult to fatten, and in consequence cannot remunerate adequately for the food they consume. Fortunately we have some superior swine in the country, and as they increase more rapidly than any other farming stock, it is quite possible to introduce an improved breed in a very short time throughout the country, if farmers only take the trouble to do so; and if they will not take this trouble, it is useless to discuss the perfection or superiority of any one particular breed over another. A good breed of swine, of that approved form, that will come to early maturity, and fatten readily, would be a great benefit to farmers and to the country generally, and in a very short period there need not be any other than a good and profitable breed in the country. There is not one circumstance that can be advanced to justify our continuing to keep a really inferior and unprofitable breed of pigs, when we have it in our power to substitute a good and profitable breed in their place, without incurring any great expense in making the change. The mode of keeping swine here in summer, in many instances, on very poor pastures and with wooden yokes on their necks, is very objectionable. They certainly might be well kept in summer on good pasture, that would be so enclosed, as to make it necessary to have yokes on them. They should be kept well rung to prevent them rooting, and with little other food, they would grow, and keep in good condition during the summer. As regards swine, however little need be said, as farmers generally understand their management better than I can tell them. The principal objection is, that the breed of swine is very generally not a profitable one, and farmers by all means should introduce a better breed as soon as possible. Pigs with short heads and short legs will pay better for the food they consume, than those with long legs and long heads, which are the characteristics of a large proportion of the present breed in Canada. Pigs might be kept on pasture in summer to great advantage, if kept separate on suitable and abundant pastures, well fenced, and kept constantly with rings in their noses, to prevent them rooting. Pigs would thrive very well on good grass or clover, with a small allowance of other food daily and a constant supply of water or other drink—of cours they should have proper shelter both from the sun

and from rain. The fattening of swine is very well understood by farmers in Lower Canada; a good breed or breeds of swine are what is most required, to replace the bad and unprofitable breeds we have. I wish it was possible to improve our cattle and sheep, and manage them to advantage as readily as we can the stock of swine, and we should have little to complain of in the management of live stock in Lower Canada. The management of swine is more under the control of our farmers, situated as they are, than any other farm stock.

HORSES.

With respect to horses, there is, perhaps more attention bestowed upon them generally, than upon any other farm stock, though their management is, nevertheless, far from being unobjectionable. It may be said that we have no distinct breed of horses in Lower Canada, but a mixture of every breed known. This confusion of breeds is to be regretted, particularly so far as regards what was known as the true Canadian breed of horses—so well adapted for the country, and for agricultural purposes. I know there have been objections made to their size for farm purposes, but if this defect really existed, it is one perfectly capable of remedy by proper selection and judicious breeding and feeding. The form of the true Canadian horse was unexceptionable, and I have no doubt he would weigh considerably more in proportion to his height, than any horse of the mixed breeds we have at present. It would be impossible to find a more perfect shaped horse for draught than a first class Canadian horse, and while we have such animals in the country, the breed might be brought up to any standard of size that would be thought necessary, by judicious management. It is by careful selection and very judicious management, that other breeds of farm live stock have been brought to the great perfection they have attained in England. It is not actual size and height which gives strength to a horse, though size and height may be necessary for certain purposes. It is the form of a horse that indicates strength or the absence of that quality. I have frequently seen horses of small size perform their work much better and with more apparent ease than larger horses. I do not advocate horses that are too small for their work as a considerable portion of our present stock certainly are, from neglect in breeding and insufficient food. The pure Canadian breed of horses when I first came to this country were of moderate but sufficient size; strong, active and hardy, well adapted to agricultural purposes. It is, however difficult now to find any of this breed in its purity, and the crosses with other breeds have not generally been an improvement, either in form, strength, activity or endurance. There are exceptions, I believe where the cross has been with imported English breeds of horses of very good quality, and of very similar form to that of a good Canadian horses. These have succeeded very well, and have enlarged the size of our horses. The true cause, however, of deficiency of size, is actually mismanagement, both in breeding and feeding, so that there is scarcely a good specimen of Canadian horse now to be found. It must be a great loss to a country to have a numerous stock of horses not sufficiently strong for work they have to perform. It is quite impossible that any breed of horses could be kept up to the proper standard of size while there was so little attention given to selection for breeding, in either the male or the female; and the latter have in numerous, instances been allowed to breed when only two years old. We could not expect any other result from such mismanagement, but a dwindled and inferior race of horses. Fortunately, it is in the farmer's power to adopt a remedy; first, by strictly confining all stallions, and not allowing them to go at large on any pretence; secondly, not to breed from any mares of inferior quality, nor allow mares to breed until of proper age; thirdly, to keep only such stallions as are expected, from their excellence, to produce good, and sound progeny. If these simple rules were strictly observed, and horses supplied with suitable food from their birth, we should have quite a superior stock of horses to those we possess at present. Horses would be a very profitable stock to cultivate here, if judiciously managed and kept up to the required standard for general purposes. There is a constant demand and a fair price attainable for almost every description and size that we have now, and we should have a very much better market and higher prices, if our horses were what they might be. The pure Canadian breed of horses are highly prized in neighboring States, but they complain that it is almost impossible now to procure any of the true breed. In Lower Canada there is every encouragement to cultivate a good description of horses, both for our own use, and for sale to foreign customers, who come to the farmers' doors to purchase them at a good price. If Canadian farmers residing at a distance from Montreal and Quebec, were to give due attention to the breeding of horse to a reasonable extent, they would pay them, perhaps, as well as any stock they could raise; but, like all other farming live stock, the success and profit will

depend upon the skill and good management bestowed upon their breeding and feeding. There are many Canadian farmers who understand the management of horses much better than I could inform them, and keep excellent horses, but it is not for such farmers that I submit these suggestions. I am well aware that we have as good farmers in Lower Canada as can be found on this continent, and who farm as well in every department as can be desired. We have also some excellent live stock—horses, neat cattle, sheep and swine, and they are well managed and attended to. It is not, however, for agriculturists who understand their own business, and who are perfectly conscious of their skill in everything which belongs to their profession that I would ever attempt to write on the subject of agriculture. I only write for those farmers who may think that some of my suggestions might be advantageously adopted, and would be an improvement of their present system of husbandry. I therefore request that skilful and practical agriculturists who may happen to read my communications will do me the justice to believe, that I do not pretend to write for their instruction; but rather to induce farmers who may not be so well qualified or instructed in their profession, to adopt the improvements that are manifestly required in their system of husbandry, and thus be upon a more equal footing with the most skilful agriculturists, which they never can be while they practise a defective system of agriculture.

Remarks.—It is generally admitted, that the arable lands of Lower Canada might very readily be made to produce on an average over double the crops they do at present, notwithstanding that we raise some excellent crops,—by a more judicious system of husbandry. There is not any doubt that the live stock of the country, though we may have a considerable proportion very good, is capable of improvemnt to fully the same extent on an average, so as to be worth double the amount they are in their present condition. It may be imagined then, how vastly the property of agriculturists might be increased, by the introduction of an improved system, that is quite possible to adopt. I have not in my power to give the exact number of our live stock at present, but supposing them to have increased within the last twenty years in the same proportion as our population have increased in the same period, our stock of horses would now be little short of 200,000, neat cattle 700,000, sheep from 800,000, to 900,000, and swine from 500,000 to 600,000, and perhaps there is from 3,000,000 to 4,000,000 arpents of land in tillage, meadow, and pasture. If this estimate is nearly correct, and that almost all these live stock, and this great extent of arable land, are only producing now, half as much as they are capable of producing annually under a better system of agriculture, should not this fact be sufficient to show that the necessary improvements should be introduced by all means that are possible. If we are satisfied our system is defective, and that these defects are of such a nature as to be under our control, and capable of remedy, as they unquestionably are, there is no excuse for allowing a defective system to continue. One of the greatest difficulties to farmers in a new country so extensive as Canada, was the want of easy access to market with their produce. Heretofore, this circumstance was felt to be a serious drawback, and excercised a very unfavorable influence on agriculture. Farmers had no encouragement to produce much in excess of the supply of their own wants in simple food and clothes, from the difficulty and expense of taking any surplus to market, and disposing of it. Now, this difficulty is to a great extent removed, and the means of rapid and cheap access to market is already very general, and likely to become more extended every day. The Reciprocity Treaty has given us the United States for a market, in addition to the markets we had before. It is almost impossible that our position could be more favorable and encouraging for the improvement of our agriculture. When I came to this country, we had neither canal, railroad, nor turnpike road, and only about half a dozen steamers on all the numerous rivers and waters of Lower Canada. Compare what we have been, with our present proud position. We have the most splendid line of canals, completing an inland water communication, that is unequalled in the world, for more than a thousand miles from sea, for sea-going ships and large steamers. We have over one thousand miles of railroad, and, I suppose, about five hundred miles more under coutract, and all these roads are constructed in the very best possible situations for affording accommodation and convenience to all classes and interests, and I have no doubt, from the high character of our country, railroads may be extended to answer all our requirements. We have turnpike roads introduced as an experiment where most required, and they may be extended by our Municipalities where considered to be necessary. We have numerous bridges over large rivers, where there was not one; and there is now constructing over the great river St.

Lawrence—a bridge that when completed, will be the greatest in the world. Our navigable rivers and inland seas are covered with steamers of all sorts and sizes. We have a weekly line of mail steamers, long established between England and Halifax, and a contract is made for a similar line between England and Montreal to commence in spring. These advantages are all, or nearly all, calculated to act as an encouragement to our agriculture, (provided the charges for transport are not too high,)and I may say, that all these advantages have been introduced within the last twenty-five years. In addition to all these, our agriculture is represented by a Department in the Government, and the Legislature have granted an aid of £250 annually to the Agricultural Societies of each county, on the favorable condition of the societies subscribing the one-third of that amount among themselves for the same object. I enumerate the advantages which our agriculturists have at present, and which they did not possess twenty-five years ago. There is another circumstance worthy of notice—that while the cost of transport of our produce to market has generally greatly diminished, the price of our produce has vastly increased. I must, however admit that with all these advantages, farmers had some draw-back, to which they were not liable previous to the year 1835. I allude to the ravages of the wheat fly, and to the potatoe disease. The first of these inflictions particularly, was a very great injury to agriculture in Lower Canada, and it was the more felt, because farmers did not adopt the remedy of cultivating other crops instead of wheat, but clung to the cultivation of the latter grain before they had discovered means of checking the ravages of the fly by substituting new varities of seed, and sowing at a later season than usual, remedies which have been found to check considerably the power of the fly to damage the crop, though it does not prevent the injury altogether. Under present circumstances the wheat fly is not so serious an evil as it has been. By skilful management, some farmers are able to grow very fair crops of wheat, and if some farmers can do this, others may do so by adopting the same means. The great advantage of skill in agriculture is, that it enables the farmer to understand and overcome difficulties that may arise, in the practice of his profession, which the unskilful farmer is unable to cope with. The markets of the United States are open to us at present, renders the cultivation of peas, barley, and oats, as profitable as wheat, particularly if these latter grains are substituted for wheat on lands that are not suitable for producing it in the greatest perfection. Farmers may rest assured that a good crop of peas, barley, or oats, which, I may add, are certain crops here when cultivated properly, will pay much better than an inferior crop of wheat, or any crop of wheat that is under a fair average. The markets of the United States were not only closed to us by heavy duties twenty years ago, but there was a considerable importation of agricultural produce from that country. Now these markets are open to us, and the importation of agricultural produce to Canada may be said to be at an end. These advantages are more than sufficient to compensate us for the damages of the wheat fly and the potatoe disease, particularly now that a remedy for both these inflictions is better understood. I have no doubt that with the advantage of the Reciprocity Treaty, Lower Canadian farmers will find it their interest to grow barley, peas, and oats, rather than wheat, where there is any uncertainty of a fair crop. It is better to allow those who can, grow wheat, and we can exchange the grain we grow in perfection for wheat. It appears to be a very proper subject of enquiry, whether our agriculture has made that progress in improvement within the last twenty five years which might reasonably be expected, under all the favorable circumstances I have enumerated. So far as I am acquainted with the subject, I have no hesitation in saying that very considerable improvements have been introduced, and with every prospect that these improvements will rapidly extend; but, at the same time, it must be manifest, from this review which I have attempted, that our agriculture generally is still in a very backward state, and is susceptible of vast improvement in every department.

My chief object in preparing this imperfect review is to bring this subject, that is of such vital importance to Canada, prominently before the public and agriculturists in particular, that means may be adopted to correct any defects that are found to exist in our system of husbandry. I know that the progress of agricultural improvement must be slow but at the same time, we should accelerate progress as much as possible. I must, however conclude for the present, but I shall have to tresspass upon you on a future occasion.

AGRICULTURE IN LOWER CANADA.

I suppose it to be an established fact, that Agriculture was the first art practised by mankind, and as it was the most necessary art from the creation of the first man, Adam, we might naturally expect that it would by this

time, have attaind to the greatest perfection it was capable of. Experience, however, convinces us, that though our teaching has continued for a period of near six thousand years, without the interval of single year, except during the time of the Flood covering the earth we have not yet learned perfectly either the art or the practice of Agriculture—notwithstanding that the art and practice is, by most persons, considered very simple and easy to be understood. No doubt the principles of the art are very simple, and consist chiefly in first draining the land of superfluous moisture. Secondly,—breaking up the soil intended for growing crops thoroughly and effectually, by the plough or otherwise. Thirdly,—by supplying the soil with manure when required, to restore fertility to the soil if exhausted by producing crops. Fourthly,—to sow good, clean, and unmixed seed, of whatever variety, in the proper season and in a judicious manner. Fifthly,—not to allow any plant to grow with the cultivated crop, except such plants as are the produce of the seed sown. Sixthly,—to establish some fixed rotation of crops, suitable to the soil and the locality, and to carry out this plan of rotation as closely as circumstances will admit, constantly observing the rule of not allowing the same species of grain or roots to succeed each other upon the same soil for two years in succession, and not to cultivate any species of crop which the quality of the soil is unsuitable to produce in perfection. Seventhly,—when lands are let out of tillage with whatever object, to seed them down invariably with some variety or varieties of grass seeds, and thus give the land a chance of being covered with verdure, as when first brought under culture, whether of grass or trees. This would be doing justice to the soil, for which it will make a generous return. The subsequent management of crops I shall not discuss on the present occasion. In my Treatise on Agriculture, published many years ago, I endeavoured to describe this management, and I could not give any better description now. If the rules I have above enumerated were properly executed and carried out, we should not have much to complain of in the tillage part of our agriculture, and, though they are very simple yet they are manifestly necessary to be observed, in order to insure good crops and preserve the quality of our soil from deterioration. No doubt, agriculture in every department, has attained to a great degee of perfection in the British Isles, though all circumstances considered, this perfection is not surprising at this advanced age of agriculture. Continued from the time of Adam. However, it would appear to be our duty to imitate the improvements so successfully introduced in England so far as they have gone. Our lot has been cast in a country possessing a very superior soil that has been left in a state of nature—accumulating fertility, probably more than 5000 years longer than other parts of the world supporting a large population.. Undoubtedly these are favorable circumstances, and we should show our appreciation of them, by endeavoring to attain a high, if not the very highest rank in the practice and productions of agriculture, as I am convinced we are capable of attaining.

The Agricultural products sent from Lower Canada to the Paris Exhibition of the products of all nations, were not very carefully selected, because there was not sufficient time or notice to make the selection, and it was so late in the season that most of the produce was disposed of by agriculturists, particularly the best samples. This circumstance I had an opportunity of ascertaining in my capacity as Secretary to the Montreal Central Committee for the Paris Exhibition. But, notwithstanding these unfavorable circumstances, almost all the products sent, except Fall Wheat, of which I believe there was not any sample sent, took first class prizes. I can further say, from experience, that there are hundreds of thousands of acres of lands in Lower Canada of equal, if not a superior natural quality to the lands which produced the samples of grain &c., sent to the Paris Exhibition. This is an unquestionable fact, and why then should we be second to any country in any Department of our Agriculture, or the qality of any part of our produce be inferior? Now is the time for action, when the products of Canada have attained so high a position when in competition with the products of the first countries on earth. We shall have numerous visitors to see the country whose productions and other wonders, stand so high in the Exhibition of the products of all nations; and it becomes our duty, in order to secure a consistent character, that our practical system of Agriculture in every department, should be in strict accordance with the high character our products have attained in Paris.

Probably many who have read my late communications on the state of our agriculture in Lower Canada, may be disposed to entertain a different view of it from that which I have given. It is not by any means my wish to give an unfavourable view of our agriculture, but only to state things as they really are, and suggest improvements which I think might be advantageously introduced. It may be replied that the changes I propose, if they

are desirable, can only be introduced gradually and will require a long period to bring them into operation. It is certain, however that the longer we put off improvements that are required, so much longer do we put off obtaining the advantages we might expect to derive from them, and they will have to be adopted at last. At the present moment there is more encouragement for agriculturists to produce abundantly, than ever was offered to them before in Canada. What does it signify to farmers that there should be high prices—many good markets, with easy and cheap means of access to them, if they have no surplus produce to dispose of? What is the advantage to us if we have millions of acres of good land in tillage, meadows and pastures, and hundreds of thousands of horses, cattle and sheep, if all are not judiciously cultivated and managed so as to yield the greatest amount of annual production, or, at all events, what might be considered a remunerating average of production? There is another incentive which should have as powerful an influence upon agriculturists as upon any other class of the community—the desire to possess the means of obtaining the necessaries, conveniences, and even the elegancies of life, to as great an extent as possible. Now, it is quite certain that unless we are able to raise a considerable surplus from our farms over what is required for simple food and clothing, we cannot have many of the enjoyments that are common to classes of this community. Farmers are generally proprietors of the farms they cultivate, (about 100 arpents)and under good cultivation and management, they should afford means of very comfortable living to their owners. Of course, what might be thought a comfortable or respectable mode of living by some parties, might be considered quite the contrary by others; but I shall not attempt to define the standard of what should constitute the one or the other. It is sufficient for my purpose to say, that the larger the quantity of produce we obtain from our lands in every way, the more we shall have at our disposal to expend, and undoubtedly, the means to expend is calculated to afford a great amount of satisfaction both to ourselves and others, if we know how to expend on laudable objects.

When I have expressed regret at the backward state of agriculture, it has frequently been replied to me, that the farmers were perfectly satisfied with their condition, and were not desirous of any change, and that it was nothing less than offensive intrusion to find fault or object to their modes of cultivation and management, or to recommend new systems for their adoption. To avoid giving offence I have been always very cautious, and rather endeavoured to demonstrate what was objectionable, than condemn it without explanation. I have ever wished honestly to submit the result that might be expected from different systems, and recommended that for adoption which I conceived to be best and most profitable. It would be a great improvement, if agriculturists in Lower Canada would not cling to a defective system and practice of husbandry that must be unprofitable. We owe a duty to our country as well as to our own interests, to adopt all practicable means that the lands we occupy shall produce as much as they are capable of producing, and there is not any one who knows the country that will pretend to say that we do so at present. There is another circumstance worthy of note, that the lands we occupy, unless they are constantly improving, must be deteriorating, and if they are deteriorating, as they must be if our system of cultivation and managemen is defective, what must result from all this at last, but that they will become worthless. There is a simple fact connected with sheep which I omitted to mention under the heading "sheep." It has been ascertained that the careful and regular feeding of sheep has a most important influence on the value of the wool. As the general rule, whatever keeps the animal in a healthy state promotes the regular growth of the wool, and thereby renders it more valuable for whatever purposes it may be applied. It is found in England that when sheep have not a sufficiency of good food, the wool grows irregularly, and the sheep is rendered tender and weak at that part which was growing when the check to its supply of food took place. With such facts before us, what can we expect from our sheep if not sufficiently provided with suitable food at all times? It is by hearing results of practice in other countries that we can best understand the practice we should adopt. I have seen lately some interesting statistics of English and French agriculture, which were given in a lecture delivered in Cornwall, England, by M. De La Trehounais, an eminent French Agriculturist, who has purchased largely English breeding stock and sent them to France He stated that the average produce of wheat in England was 32 bushels to the acre, and in France it is a little less than 14 bushels to the acre; that there is 1½ sheep kept for each acre in England, and only 1-3 of a sheep kept to the acre in France; that 4,000,000 cattle are slaughtered annually in France, weighing on an average only about 2 cwt. each, and in England less than half that number of cattle

but weighing on average about 5 cwt. each. Though in this review, I have undoubtedly found great fault with the general management of cattle here, yet I believe the average weight slaughtered in Lower Canada would exceed the weight of the French Cattle, if the lecturer was correct. But however all this may be, I conceive I was perfectly justified in all I have said in relation to our cattle and sheep, Our aim should be to equal, if not surpass, others and not excuse any deficiency by imagining that we are not inferior to other agriculturists. I have trespassed to a great extent on your columns, but I must beg your indulgence a little longer before I can conclude my task.

If any proof was required to convince us that Lower Canada was capable of producing excellent wheat, barley, oats, peas, beans, timothy seed, &c., the Exhibition of these grains on the 25th of March, in the Bonsecours Market, at the instance of the County of Montreal Agricultural Socety, would demonstrate the fact in the most satisfactory manner. The samples, which, I believe, consisted of about 20 bushels each, were numerous, and I may confidently say, there never has been a better show of these grains in this country, than upon that occasion. There was no wheat exhibited except spring three months' wheat, of the variety Fife and Black Sea, all of which were of very superior quality, clean and unmixed. Of course, spring wheat could not be expected to compete in appearance with choice samples of fall wheat; but with this exception, I have no hesitation in stating that the grain of every description exhibited on the occasion alluded to, would compete favorably, and, I have no doubt, successfully, with any samples of the same varieties that could be produced in Canada West, or in the United States. I have had opportunities of seeing exhibitions of grain in both countries, and, as I have stated, with the exception of fall wheat, I have no doubt Lower Canada can compete successfully with any part of North America in the production of any other grain, and also in hay, and every variety of root crops. I admired particularly the samples exhibited, for their perfect cleanness, and appearance of being unmixed. The Montreal Agricultural Society are entitled to the thanks of agriculturists for this judicious move, and I hope they will have an annual exhibition. The premiums paid were very liberal, and amounted to about £45. The greater part of the grain was the production of the Island of Montreal, though the first prize wheat was from the Isle Jesus. I allude to this exhibition of grain as an encouragement to agriculturists to introduce improvements in their system of husbandry, where it may be required, as it must be in every instance where there is not favourable and remunerating results obtained from farming. We may be assured, if we take the trouble to enquire, that the excellent samples of grain exhibited at Montreal on the 25th of March, was not produced by chance, but that in every instance, good samples resulted from skilful and judicious cultivation and management; and any farmer who desires to produce similar samples of good grain, will be certain to succeed, provided he adopts the same skilful and judicious cultivation and management of his land. These are evident facts that cannot be controverted. The successful agriculturist has the same climate, and generally no better soil than the most unsuccessful agriculturist, and, therefore, the very different results obtained by each from their land and labour, results solely from the cultivation and management of the soil. Farmers need not expect to excuse their want of success, by complaining of insufficient capital, &c. I have known many persons here, who, with scarcely any capital to commence with, have succeeded in making themselves very comfortable, if not independent, and altogether by their skill, industry, and good management in agriculture. Any excuses for bad management in the practice of agriculture should not be admissible, while better management is possible. It is quite absurd for a farmer, when he witnesses the successful practice of another farmer, to suppose that he could not adopt the same practice. The feeling that should animate and predominate with every agriculturist ought to be a desire to equal, if not excel, those farmers who practice a judicious and successful system amongst them. I cannot understand why any farmer should rest contented with raising only one-third or one-half the produce, which he sees another farmer can raise with the same climate, and on soil that is not naturally better than his own. If I see my neighbor's land well drained, well ploughed, sufficiently manured, good crops growing upon it, free from all weeds, live stock of fair quality, provided with sufficient pasture—while my own land is not well drained, is not ploughed in the best manner, has not an adequate and regular supply of manure judiciously applied, my crops not very abundant or clean of weeds, my live stock not of good quality, or having sufficient pasturage, surely I cannot be at any loss to account for the different results obtained by my neighbour and myself. Hence it would appear, that there is not in reality any excuse that our system of agriculture is not generally better than it is. I am sorry to be obliged to admit, that what we should understand as good farming, is the exception, and not the rule in Lower Canada; nevertheless, there is sufficient specimens or examples of good farming in every district, to show what it is, for our instruction, and this removes all ground for excuse for continuing a defective system of husbandry, because we can see before us continually, the practice, and the results obtained from good husbandry to encourage us to follow the example. It may probably surprise farmers, when I tell them, that the productions which are obtained from the most defective system of husbandry, and the least expenditure of labour and capital, costs the farmer more per bushel, than the production which results from the most per-

fect system of agriculture, and the ample but necessary, and judicious expenditure of capital and labour, practised in Canada. The farmer who is able to raise a produce of 30 bushels of wheat per acre, and of other crops in the same proportion, can do this at less expense per bushel, than it will cost the farmer per bushel, that will only raise 8 or 10 bushels of wheat per acre, and of other crops in proportion. If we compare the average produce obtained per acre by one of our best farmers, with the average per acre obtained by the great bulk of Canadian agriculturists, who practice a defective system, we shall be able to form some estimate of the great advantage of a good system, and the very great loss to the country generally, which results from a defective system of agriculture. I would be the last who would recommend a large and extravagant expenditure of labour and capital in agriculture, because I know that beyond a certain limit it would not be expedient or profitable to do so. In fact, capital should only be applied so far as its employment *lowers the cost* of agricultural production. This is the grand secret of all improvement, and where the cost of production is not actually diminished in proportion to the expenditure, I would not consider it an improvement in agriculture. The skilful agriculturalist, who employs capital or labour judiciously in the cultivation of land, is sure to diminish the cost of production, or as I before observed, he will raise a quantity of produce from his land and labour that will not cost him near so much in proportion to quantity, as it will cost the farmer, in proportion to quantity, who raises the least produce. In the present circumstances of Canada, if we desire to maintain the credit of the country, and the high character we have attained, the improvement of agriculture is no longer a matter of choice or fancy, but a matter of comparative necessity. All the great things that has been done for us, and the fine things that have been said of us, will be of little avail, if we do not help ourselves, by making a good use of what has been done for the encouragement of agriculture, and thus proving that we are not unworthy of the high character we have attained with the world. We should endeavour to come up to the full standard of perfection in our system of agriculture, when we have abundant examples of a system that is very near perfection. I think I am perfectly justified in stating, that upon a well managed agricultural establishment, of which there are a great many to be seen in the British Isles, if not in Canada, the practical art of agriculture, in every department, including the management of land, the live stock, and the implements employed, are as well understood, and brought to as great perfection, as is the produce of any other art or manufacture practised in Britain. The improvements in agriculture are decidedly good, both as regards the increase of quantity, and the improvement of quality,—and this is more than can be said in relation to all other arts and manufactures. There is no manufacture practised by man that can compare with an agricultural manufactory that is well conducted, in the excellence and perfection of its productions. There is no deceit or deception in a fine animal, or in the productions of a well managed field or garden. I have never seen any of the products of manufacture brought to so great perfection, and so free from deterioration as are the products obtained from a perfect system of agriculture,—where the animals of every variety are of perfect form, and adaptation for their several uses,—and the products of the field, of the finest quality, without any deteriorating mixture. We cannot bring our oxen to the size of elephants, nor would it be advisable if we could do so,—nor can we bring the grain of wheat to be the size of a horse bean, and I believe it would not be an improvement if we did. Animals, and field productions are, however, brought to a high degree of excellence, if not to actual perfection, and if this can be accomplished by many agriculturalists, I cannot see why it should not be possible to all, who would employ the same means, with a favorable climate, and a naturally good soil. I mention these circumstances because agriculturalists are often taunted as being behind this age of progress, in the improvement of their art. No doubt many farmers are very backward, indeed, in adopting the necessary improvements in their system of husbandry; but I am persuaded, nevertheless, that agriculture in numerous instances, has attained greater perfection than any other manufacture that we are acquainted with. This is an important point achieved, in favour of general improvement. And it is no wonder that agriculture should have been brought to this great perfection. In the British Isles, the best educated and the most wealthy of the community are engaged in agriculture, and connecting science with practice, work it out in the most judicious and successful manner; and thus, by their capital, experiments, and example, instruct and encourage tenant farmers to adopt improvements that are proved to be advantageous. This is a proof of the vast importance of education to agricultural improvement. Without any wish to give the slightest offence, I may submit that uneducated men certainly may be induced to adopt improvements which they can see practised successfully and profitably before them; but improvements in agriculture seldom originate with them, though they may work them out when they have a good example before them. Agriculture is a science that can be best explained by actual experiments in the field, and it would not have attained to anything approaching its present perfection in Britain, were it not for the lead taken by the wealthy and educated, by having these experiments judiciously made, both in the field, and in the management of their flocks and herds. It is from these circumstances only that agriculture, in all its branches, is brought to greater perfection in Britain than in any other country, so that it has become the admiration and example of all the civilized nations of the earth.

The subject of education has been fully

discussed lately in the Legislative Assembly; but I was surprised to see no allusion to the necessity that agricultural instruction should be directly provided for in the system proposed. No wonder our youth should not estimate very highly the occupation of the agriculturist, or regard it as a respectable profession. He perceives from his childhood that education is highly prized, and considered actually necessary for the successful practice of any respectable profession, or even handicraft trade; but for the occupation of the farmer it does not appear to be an essential qualification, and he therefore despises such a profession, as only fitted for the most ignorant and illiterate. I have frequently endeavored to show the injurious effect on agriculture that the youth of the country, who do receive education, are more disposed to other professions than to be agriculturists. This I attribute partly to the course of education they receive, wherein the science and practice of agriculture is never mentioned or alluded to, no more than if there was no such science to be learned; also, to the circumstance of witnessing in numerous instances the defective practice, and unfavorable and unprofitable results obtained from agriculture. All these causes operate unfavorably upon educated young men, and lead them to suppose that farming is only fit for the ignorant and laborious, or for the wealthy classes, who engage in it for the pleasures and amusements of a country life, and work the farm by hired laborers. It must appear strange that, although five-sixths of our population have to make their living by agriculture, there is no direct means provided for instructing them in the science and art of agriculture, except what they may learn from those who are not the most capable of instructing them. Every other profession and occupation have a suitable education provided, that has direct reference to their future pursuits, while agriculture is denied any similar advantage. Schools for the rural population should at least be furnished with standard and suitable books on the science and art of agriculture, and these books should form a part of the study of every male scholar. There are excellent Agricultural Catechisms, and other books on the subject might be selected which would be plain and easy to comprehend. At all events, such books would convince the scholars that there were means of teaching the science and art of agriculture as well as any other art or profession, and it might have the effect of giving many a taste for agriculture, and a desire to understand it thoroughly, which they are never likely to feel, if their education has no reference whatever to it. We should also have properly qualified persons to deliver practical lectures on the subject at all our colleges and schools. However agriculture may be despised and neglected, it is an occupation, above all others, which we cannot do without, and therefore it will be for the general benefit of the community that it should be understood and practiced in the most perfect manner that is possible; and if we are in earnest in our desires that our agriculture should improve and flourish, we must give it importance and respectability by a direct education for it at our schools and colleges. Of course the properly educated can duly appreciate the importance and respectability of agriculture, and do not require to be told that it is the most important and most honorable, because it is the most useful and necessary of any art or profession practised by mankind, and is more particularly dependent for successful results upon the goodness of the Creator,---after man has executed properly the part which falls to his lot to perform.

I have now endeavored to give a truthful picture of the present state of agriculture in Lower Canada, and offered suggestions for its amelioration. Many parties who take the trouble to read my communication may think I have made matters appear in a more unfavorable light than they are in reality, and I wish sincerely that I may have done so, and there will be less necessity for improvement. I have had frequent opportunities of seeing the country, and the stock and crops of the farmers, and could not help imagining how much room there was for improvement, and what a great advantage it would be to make the required improvements. Throughout the Valley of the St. Lawrence, and in many other sections of the country, the general quality of the land, and its adaptation to agriculture cannot be surpassed in any part of North America, and there cannot be any doubt whatever that a large proportion of this land is not managed to the best advantage, and does not produce anything near what it is capable of producing. We are most anxious for the extension of commerce and trade, and I advocate the improvement of agriculture as the only certain means to promote and support commerce and trade, by the increased annual produce it would create. Traffic in foreign productions will never augment to any great extent the general wealth of a country, and we may assure ourselves that the wealth of Canada will chiefly depend upon her own productions, obtained from her land. It is these productions which directly and indirectly provide the means for paying almost all the claims against the country, whether for revenue, or imported goods. From any other source except the land, we need not expect much assistance in this country under existing circumstances. If this proposition be admitted, and I think it cannot be disputed, how much does it behove every lover of his country to lend his aid, and every influence he can exercise, in promoting improvements in which all are interested. I wish it was in my power to induce others to view this subject in the same light I do. If it was a political subject, or any other on which I might be mistaken, I would not presume to have kept it constantly before the public, as I have done, for the last quarter of a century. It may be replied to me, that if my views, or the suggestions I presume to offer, were considered of that importance which I attach to them, they would be immediately acted upon by those who have the power to do all that is necessary for agricultural improvement.

We have many able men in Canada, who could

do wonders for agriculture, if they would only be persuaded that they could not devote their talents or eloquence to any subject of so much importance to the whole Canadian community. Perhaps it may not be thought offensive, if I express my regret that when reading the debates in our Provincial Parliament, and admiring the eloquence of many of the speeches reported, I scarcely ever meet with one sentence that has any reference to agriculture, or its state and requirements. As the humble advocate for agriculture, it would be a most gratifying "sign of the times" if I could only see a small portion of the eloquence expended on other subjects given to the cause of agriculture, and to recommend its improvement to the rural population. If this population was only to learn, that their representatives in Parliament occupied themselves with the consideration of the interests of agriculture, and made eloquent speeches upon its vast importance, and the advantages to be derived from its improvement to the uttermost, we should soon see a change for the better, and the occupation of the farmer regarded with more favour. Our Legislature may certainly have numerous interests to occupy their attention, but I humbly conceive that there is not one of these interests that is to be compared in importance with that of agriculture, which is the occupation of the great majority of those who have elected the members of the Legislative Assembly —and as their representatives, agriculture is entitled to every possible attention to its interests so far as they can be promoted, without injustice to any other interests.

I cannot better or more appropriately conclude this communication, than by copying a few lines from a late number of that excellent newspaper—*The Mark Lane Express.* Farmers I know, are generally disposed to feel profound gratitude to the CREATOR for His never failing goodness, in the annual increase of their fields, their flocks, and their herds—which has continued from the creation of man, to the present time—and they may with perfect confidence rely upon a continuance of the same goodness.—"We should feel that we had very inadequately noticed this period of the year if we neglected to remind our readers of the agricultural class, of the source from which they derive their prosperity, and the power on whom it depends. The farmer, above all other men, must feel how helpless he is after all his efforts to secure his own welfare, or insure the safety of his crops. A blast of wind, a tempest, vegetable pestilence, may in one short day lay his hopes prostrate, and defeat his best arranged plans. On the other hand, gratitude for the past, and hope for the future, ought to fill every heart, and constitute a motive for increased efforts, and interprize. Whilst with humility we should recognize the hand of a superintending Providence, we should consider who it is that has given us faculties and powers *for use*, and not for inaction, or abuse. That we should both "plough and sow in hope," and labour as if all depended upon ourselves, leaving the event to Him who hath assured us that "while the earth remaineth, seed time and harvest, day and night, summer and winter, shall not cease."

What more can I say, or rather ought I to say. I may have been too bold, if on such a subject, I could be too bold. However, if I have said anything offensive I hope I may be pardoned, because my only motive is the good of my country.

Having submitted numerous objections to the existing mode of cultivating crops and the general management of land, which prevails in a large portion of Lower Canada, it is only reasonable that I should also submit what I conceive would be a better system of cultivation and management, that would be perfectly practicable to introduce. It is a very serious damage to any country, particularly one so much dependant upon her agriculture as Canada, if the cultivation and management of the land is so defective, that it does not produce one half the quantity or value it would be capable of producing, and as I before observed, the quality of the soil must be deteriorating under constant cropping, unless properly cultivated, and its fertility maintained by the application of manure to make up for what is carried away by crops, however scanty. Land under grass, and pastured by stock, improves every year it remains in that state, and in a few years when again ploughed up, the numerous roots of grass in the soil act as a manure to the succeeding cultivated crops, provided their vitality is destroyed, so that the grass does not grow in the crop. In any good system of husbandry that would be generally suitable for Canada, a due proportion of the land must be kept under grass, not as at present, left waste for only one year, producing a scanty herbage of wild grass and weeds, but in grass produced from seed sown, or natural grass which must replace sown grasses after a few years. No ordinary farm can be managed with profit to its owner, that has not a due proportion of good pasture that will support his live stock in a thriving and improving condition during the summer. This may be considered as an established fact, unless stock are housed and supported on green food in summer. The rotations which I shall now propose provide for a due proportion of each farm to be kept under grass, and when considered advantageous, some parts may be continued in grass for a much longer period than I propose in the rotations. The plan of rotation which I shall now submit, differs very little from that which I gave in my Treatise on Agriculture many years ago, but I hope it will be found perfectly adapted to our present circumstances. I do not pretend to submit any other good system of husbandry that has not been already known and practised successfully, and my description cannot possess any great originality upon a subject which has been so ably treated by the most eminent agriculturists of this age of experiment and progress.

ROTATION OF CROPS, &c.

The distribution of crops, and plan of their succession, is one of the first subjects to which all farmers require to direct their attention

Whatever little regard has been hitherto paid by farmers to a proper rotation of crops in Canada, is now a point on which their profits depend more than on any other. The kind of crops to be raised are determined in a great measure by the climate, soil, market and demand.

It has been found by experience, that besides the general exhaustion of manure or vegetable food produced by vegetation, especially those plants with farinacious seed, each kind of crop has a specific effect upon the soil, so that no care or manure can make the same ground produce equal crops of the same kind of grain, for any length of time, without the intervention of other crops. Whether this be owing to any peculiar nourishment necessary to each particular kind of plants, or because plants not indigenous degenerate in a foreign soil, the fact is certain with respect to most crops usually raised. This points out the advantage of varying the crops according as they are found to succeed best after each other. In general, all kinds of grain succeed best after a crop which has been cut before the seed has ripened, or the stem is dried up. Those plants which have a naked stem with few leaves thrive best after leguminous plants, which have more succulent stems, and which bear their seed in pods, as peas beans, tares or vetches, or after succulent roots which strike deep into the ground, as carrots, parsnips, beet roots, and even potatoes. From this circumstance, confirmed by universal experience, the different systems of rotation have had their origin, taking the quality of the soil into consideration.

In the Brtish Isles, where the farmers have to pay heavy rents on short leases, there might be some excuse or justification for farmers deteriorating the lands by severe cropping; but here no such necessity exists, and consequently no such justification. Farmers are proprietors, and if they exhaust the soil by tillage beyond the point consistent with good management, they will be sure to pay dearly in the end for every crop forced from the land unreasonably. A farmer who is a proprietor, cultivating his own land with skill and experience, if he understands the quality of his soil, and state of his field, will know what crops are most likely to grow well in each; he will know what is most in request, both for his own use and in the market, and he will act accordingly. But if he allows his land to be impoverished for want of rest or manure, or to run wild with weeds, he does not exercise the experience, judgment or activity necessary to make his profession and pursuits profitable, whatever his skill or experience may be.

The system of rotation is adapted for every soil, though no particular rotation can be given for any one soil which will answer in all cases. In some situations much depends on the kind of produce for which there is the greatest market demand; indeed, this will influence rotations directly or indirectly in every situation. But whatever the system of rotation that is followed, if the several processes of labour which belong to it are properly executed, land will rarely get into a foul or exhausted state, or at least, if foul or exhausted under a judicious rotation, matters will be much worse when no proper system is followed.

The particular crops which enter into a system of rotation must be such as are suited to the soil and climate, varied by local circumstances, such as the proximity to towns, where there is generally a demand for potatoes, carrots, turnips, hay, &c. In a thinly peopled district, peas, beans, tares, hemp flax, summer fallow, clover and timothy, might be interposed between corn crops on clay soils, and potatoes, carrots, Indian corn, clover and timothy, on dry loams and sands. A variety of plants such as beans, peas, tares, hemp, flax, Indian corn and carrots, might occupy a part of that division of a farm which is allotted to green crops, and on good lands, well managed, these plants might be grown to prepare the soil for grain, without perhaps resorting to summer fallow, except very rarely when the land is very foul.

A farm of strong, rich soil, divided into six fields or enclosures, might have half the farm under different species of cereal grasses, or grain crops, peas, beans, tares, roots, or plain fallow; the other half under cultivated herbage, meadow and pasture. The rotation and distribution of crops might be the following:—

One field or division, equal to one-sixth of the arable land, to be under wheat, if the soil is suitable, and the wheat a variety that will resist the fly; if not, barley or oats should be substituted. The wheat to succeed green crops or summer fallow, and the land, with this crop, or any other crop substituted for it, to be seeded down invariably with clover and timothy, or other grass seeds. Second field, or one-sixth ploughed in the previous fall, after pasture, to be in peas and oats, or perhaps all oats. Third field, or one-sixth, (following after oats and peas the year before,) to be manured with beans, peas, potatoes, carrots, and mangold wurtzel or turnips; and should the farmer be unable to find manure for the whole division, he may fallow the remainder, or sow tares, or some other green crop which he might plough in a manure if necessary. This last division will be prepared for wheat or barley the ensuing spring, and be seeded down with whatever crop is sowed. The other half of the arable land, comprising three fields or divisions, should be in meadow or pasture. One field or division, equal to one-sixth of the whole, coming annually into tillage, to replace the division seeded down yearly with the crop of wheat or barley, as before stated.

On farms of light or sandy soils, divided into nine fields or enclosures, the tillage should not exceed one-third of the arable land, or three fields in tillage, and six in meadow and pasture. By this rotation the land would be under grass six years out of nine, instead of three out of six, as in the first rotation, the management and course of cropping for the part in tillage to be the same as that laid down for the rich or clay soil, varying the distribution of crops to suit the quality of the soil, and introducing Indian corn in this rotation.

It may be expedient to vary from these rotations.

The experienced farmer will understand when and in what manner it will be prudent to do so. I believe, however, that the more nearly the rotation adopted in Canada is conformable to these general rules, the more certain will be the profitable improvement of agriculture. This system of convertible husbandry is the most suitable to the present circumstances of this Province, and of British America. Under this course of husbandry the lands would be constantly in good heart, capable of producing abundant and excellent crops, and though the largest portion may be under cultivated herbage and grass, I am well convinced the gross produce of the land, and the farmer's profit, may be augmented two or three fold, if the produce be judiciously applied, and the rearing and feeding of cattle, for the dairy and the shambles, extensively introduced. Peas, beans, tares and roots may be raised in this rotation in great abundance, for feeding cattle and hogs, and a great quantity and a better quality of grain produced in one year, than under the present system of farming can be produced in two.

"No food, no cattle: no cattle, no dung; no dung, no corn; is a maxim that ought to be fixed in every farmer's mind."

Not to repeat the same kind of crop at too short intervals, is a rule, with regard to the succession of crops, that ought to be strictly observed. Whatever may be the cause, whether it is to be sought for in the nature of the soil, or of the plants themselves, experience clearly proves the advantage of introducing a diversity of species into every course of cropping. On new land, or land that has been pastured several years, before it is again brought under the plough, there may be less need of adhering steadily to this rule; but the degeneracy of wheat, and other corn crops recurring upon the same land every second year for a long period, has been generally acknowledged.

Wheat, it is supposed, cannot be grown in perfection, on an average, more frequently than once in every five years on the same land. Beans, peas, potatoes, carrots and red clover, that may be called green crops, become in many instances less productive and much more liable to disease, when they come into the course, upon the same land, every second, third or fourth year. What the interval *ought* to be has not yet been ascertained, and from the great number of years that the experiments must be continued, to give any certain result probably cannot be determined until the component parts of soil, particularly the sort of nourishment which each species of plant extracts from the soil, have been more fully investigated. All good farmers will, however, avoid overcropping, or treating land in any way so as to exhaust its powers, as the greatest of all evils.

A new system of cultivation has been lately introduced in England, by which it is said that large crops of wheat are produced in succession annually, upon the same land. The whole of the land is cultivated, and the wheat sown in drills three feet apart. While the wheat is growing, the intervals between the rows are deeply and frequently cultivated with the spade, and immediately after the crop is reaped wheat is sown in rows upon the cultivated intervals, without the application of any manure. The crops thus raised for several years in succession, are said to be as large as if the whole of the land had been sown. This circumstance can only be accounted for by supposing that the deep and frequent stirring up of the soil, and exposing it to the atmosphere, has a very beneficial influence, and counteracts the ill effects produced by repeating the same kind of crops upon the same soil for many years in succession. This system, however, is not likely to come into operation in this country under the present circumstances of abundance of land, with a high price for labor.

I do not pretend, in this short notice, to do more than submit what I conceive to be the most judicious plan for sub-dividing ordinary farms, and a simple outline of the rotation of cropping which might be introduced. This plan of draining and rotation is not alone suitable to farmers in the Seigniories, but may be introduced on farms of every description, and in every section of the country. Whatever may be the system of subdividing draining, and rotation of crops adopted it must have a vast influence upon the actual profits derived from farming.

Where there is not a proper rotation of crops observed, it is not possible to keep land in proper condition, or profitable cultivation; and with a proper rotation carried out, upon land sufficiently drained from superfluous moisture, sufficient manure may generally be obtained, and profitable crops produced. I understand that a proper rotation implies that all manure that can be made upon a farm shall be judiciously applied at the most suitable season.

As regards the natural productive powers of the Canadian soil, it is, I am persuaded, generally equal to that of any country on earth, and with judicious cultivation and management, crops of every species and variety, usually grown in England and France, might be produced in Canada in great perfection, with perhaps the exception of wheat, which latterly has become very liable to injury by the ravages of the wheat fly, though there are some varieties of wheat that resist the the attacks of this destructive insect. The climate and soil of Canada is also extremely favourable for the production of hemp; and all that is required to bring flax and hemp into extensive cultivation, is, that we should have mills provided to dress and prepare the fibre. The cultivation of these plants could not be introduced here to any advantage hitherto, in consequence of there not being mills to prepare the fibre. If parties were to purchase hemp and flax when produced by the farmer, it would encourage these productions, and make up, in some degree, for any deficiency in the wheat crop from injury by the wheat fly. I would observe, however, that this insect is not confined toCanada but is equally, if not more destructive in many of the States of the Union.

Both our soil and climate are favorable for Agriculture, but the success of the Agriculturist mainly depends upon the skill and industry with which he practices his art. It is an established

principle of good husbandry, that whatever the rotation, land must be well drained, well ploughed, sufficiently manured, good and unmixed seed made use of, the crops kept clear of weeds, and every work executed in proper season. The live stock of every description must be well chosen, managed judiciously, and well kept; and the products of the dairy must be mauufactured so as to insure the best articles of butter and cheese, and the highest prices of the market.

It may be expected that I should state the average produce in Lower Canada, but there is such a wide range in this average that I could scarcely venture to do so, with any pretension to accuracy. Products depend so much upon a variety of circumstances, of soil, cultivation and management, that you may see in one field an excellent crop, while on the next farm the crop is poor and scanty. I shall therefore only state what soil of ordinary quality may be brought to produce in ordinary seasons, under a judicious system of husbandry and good management:—Wheat, in consequence of the wheat fly, has, for the last few years, been an uncertain crop; but even within that period I have known it frequently to produce 30 bushels per arpent. But between 20 and 30 bushels of spring-sown wheat are very commonly produced per arpent on land properly cultivated, but without any extra expenditure in cultivation. Fall-sown wheat succeeds occasionally, but is too uncertain a crop to warrant cultivation to any great extent.

Barley from 25 to 40 bushels per arpent.
Rye not much cultivated.
Oats from 20 to 40 bushels per arpent.
Peas from 15 to 25 do do.
Beans about the same.
Indian Corn from 25 to 60 bushels per arpent.
Potatoes, free from disease, from 100 to 200 bushels per arpent, or perhaps 300 bushels.
Carrots, Parsnips, Mangold Wurtzel and Turnips, produce very good crops, except the latter, which is very liable to damage by the turnip fly. Flax and Hemp produce large crops under proper cultivation; but neither plants, particularly the latter, are cultivated to any great extent.

TILLAGE.

In my review of the tillage of Lower Canada I shall only refer to that which I consider defectively managed. There is a considerable portion of arable land managed in the very best manner, and producing excellent crops of every species, and therefore there is no necessity to suggest any changes to farmers who already understand and practice a system that is both productive and profitable. My object is to suggest improvement when they are manifestly required, in order that every part of our arable lands shall be managed in accordance with the established rules of good husbandry, and produce abundant and remunerating crops of every variety cultivated in Canada.

Wherever the practice prevails of having too large a proportion of each farm annually in tillage under cereal crops it is very objectionable, and cannot fail to deteriorate the soil, and render it unfit for producing remunerating crops, particularly with the mode of cultivation generally adopted in a large portion of Lower Canada. The usual plan is to have nearly one half of the arable land ploughed in the fall or spring, and sown with wheat, oats, peas, and perhaps barley—and very rarely any manure is applied, except occasionally upon a small part, which I shall hereafter refer to. The succeeding year this division of land is allowed to remain waste without having had either clover or grass seed sown on it, and consequently it only produces weeds and natural grasses, affording a poor pasture for the farmers' live stock until it is again ploughed up at the end of the year. The second division of land is ploughed up when the first is let out waste, and is cropped in the same way as the first division, and when the crop is off, this also is let out of tillage as the first, without any grass-seed or clover sown upon it. This alternating system is carried on for an indefinite period, and I have no doubt it has in some instances been continued for a century or more. Hence the land receives only one ploughing and one harrowing (neither executed in the very best manner) in the year, producing one crop which can scarcely be expected to be large or remunerating from such management. This mode of cultivation is inconsistent with any system of good husbandry. Land constantly cropped in this manner with grain, without any green or hoed crops intervening, or summer fallow to clean the land, must become full of weeds and roots of natural grasses. The year the land is waste, let out of tillage without either clover or grass-seed, encourages the growth of weeds, natural grasses and vermin, so that it is almost impossible to have a clean good crop upon it the succeeding year when again brought into tillage. Wild peas and other seeds of weeds get mixed with the grain produced, if not separated from it when it is again sown. The grain that is generally sold in our markets is very generally mixed to a considerable extent with these wild peas and seeds of weeds and hence it is almost impossible for any farmer to keep his crops or his lands free from injurious weeds. This nuisance cannot too soon be put an end to. The ploughing which the land receives is always in the same direction—and never cross ploughed, so that the soil is not at any time broken up or pulverised as it should be in order to prepare it for producing a good crop. There is not one circumstance connected with this mode of

cultivation to recommend its continued practice. The frost and snow of winter undoubtedly have a very beneficial influence upon ploughed soil, particularly if it is strong clay, and drained sufficiently; and I have no doubt our crops would not be even so good as they are, only for this beneficial action of the frost and snow upon the soil. With regard to general management and the application of manure, it could be scarcely more objectionable. Most farmers make use of a part of their manure annually for growing potatoes, Indian corn, and garden vegetables for their families, but as I stated in my first communication on this subject, I do not believe that the green crops annually cultivated amount to two per cent of the arable land of each farm. I should except, perhaps, land cultivated with potatoes for the supply of towns. The remainder of the farmer's manure, except that employed as I have stated above, is generally left in the yard, spread over a large surface until the month of June or July, and frequently for many years, and consequently its best qualities are suffered to evaporate, or be washed away with rain or snow water. This manure is ultimately carted to the field in summer, and thrown down in cart load heaps, exposed for three or four months to the summer heat, so that by the time it is spread and ploughed into the soil in the fall, it has not much value as a fertilizer. There is another objection, that when this manure is taken to the field, the quantity placed upon one acre, would be sufficient for five or six acres, if it had been properly managed and distributed. Hence, while only one acre is manured, five acres equally requiring to be so, are left without any. Perhaps there may be from twenty to fifty acres of land ploughed in the fall upon an ordinary sized farm, and not a tenth part of it manured in the slovenly way described above. In my first communication I endeavored to describe the defects in ploughing and the consequent imperfections in harrowing, and there is no necessity to repeat what I said on this subject. If however, ploughing and harrowing were executed in the most perfect manner possible, we could not expect that good crops of grain would be produced in continued succession upon the same land, every alternate year, only receiving one ploughing and harrowing in two years without the application of any fertilizing substance, except upon a small proportion. This mode of cultivation might succeed upon a new fertile virgin soil, but it will not answer upon lands long in cultivation under a very defective system of husbandry. I know farmers who raised very fine crops last year, but certainly not by such a system of agriculture as I have described. Why should we cling to a defective mode of farming while we see other farmers adopting improvements with complete success and certain profit. It might not be prudent or advisable to cultivate green crops upon the same proportionate scale to the whole land in tillage which they do in England, but if we have not a due proportion of green crops, we should make up the deficiency by summer fallow. It is absurd to expect that we can ever grow the large crops said to be produced in other countries, if we do not adopt the modes of cultivation necessary for producing large crops. The soil is bountiful, but it will not give, give, continually, unless treated generously by good cultivation, and rendering back to it some return for its bountiful gifts to us year after year. Farmers who understand their business, adopt some plan of rotation, and when they take up land for tillage, they invariably manure it one year during rotation generally with a hoed green crop, and when let out of tillage, it is seeded down with clover and other grass seed. Every farmer should fix upon some plan of rotation, and endeavour to work it out. To plough less and plough better, would be one of the necessary improvements we should introduce. Very many farmers waste much valuable labour on tillage that does not remunerate by the produce obtained. If only half the land usually in tillage was cultivated in conformity to the rules of good husbandry, it would yield a larger produce than the whole of it does at present; and the remaining half of the land would be reposing under grass, affording ample pasture to live stock, and gaining in fertility every day, until taken up for tillage in the regular course of rotation, when the first part would be let out of tillage, and laid down with clover and grass seeds to repose, and improve without any cost to the farmer. Would not this be a better plan than the present practice of turning up a large extent of ground, that does not produce half a crop one year, and the next year produce scarcely anything until again torn up. Farmers may be disposed to set a high value on the pasture obtained from the land the year it is waste and not ploughed—but except in very rare cases, I would not estimate at much value, land left in this waste for only only one year, without having either clover or grass seed sown upon them. Within the last two years I had opportunities of seeing land left in this waste state, that was of excellent natural quality, and which I am convinced, did not yield pasturage for the season that was worth two shillings the acre, indeed, in numerous instances, the stock

pastured upon them, must have suffered greatly for want of sufficient food. How much better it would be to have these wastes going through the regular process of summer fallow, preparing the soil for yielding a good crop the following season. Part of these wastes might be sown with some crop to be ploughed in green as manure. I know it is necessary to let the land rest every alternate year under the system of Agriculture which prevails, or it would very soon not yield any crops; but I object to the whole system as faulty, and at variance with all the rules of good husbandry, and not practiced by any skilful agriculturist. I hope my remarks may not give offence, but if I expect to effect any good, it is necessary that I should deal plainly with the defects which I know to exist in our system of husbandry. If I did not endeavour to prove their existence by pointing them out, farmers might not perceive them to be defects, but attribute scanty crops to other causes rather than a defective system —or I might say, the absence of all system. Perhaps no man would venture to address farmers as cordially as I do, but I presume upon their favour, in consideration of the many years I have occupied myself on this subject, that they will not be offended, but give me credit for good intentions towards them, however they may differ with me in regard to my views and suggestions. I persevere almost against hope, and persuade myself, that by constantly bringing the subject of improvements before agriculturists, they may be induced at last to give my suggestions some consideration. I desire no more than to have suggestions considered, and am perfectly content that any proposition of mine shall be carefully examined, and rejected at once if not found correct, reasonable and as practicable as they are necessary to the success of agriculture. It may be very well to talk of improvements, but in agriculture I would not consider any change in our system would be an improvement, that could not be demonstrated to be profitable. Houses, gardens and domains may be improved for the convenience and satisfaction of their owners; but improvements in agriculture are expected to be remunerative, as farmers have not money to throw away, and I should be the last to suggest or recommend changes or improvements which I did not feel convinced would yield a money profit if judiciously carried out. From the best cultivated soil, we frequently see a produce that is not of the best quality, occasioned by excessive luxuriance in a favorable season, with rather an excess of moisture at a certain period of the growth of the crops, which causes it to lodge. This circumstance, however, does not diminish the fertility of the land, although it may diminish the value of the grain, and may perhaps check the growth of the clover and grass seed sown with the crop. It is possible for the skilful farmer to prevent in some degree this excessive luxuriance, by applying remedies which are in his power, but this must be done previous to, or at the time of, seed sowing in spring.

The application of salt at the rate of from five to ten bushels to the acre, is found to check excessive luxuriance, or at least to give strength to the straw, that it will not lodge or fall down. Not to sow the seed too thick on rich land is another preventive, and deep ploughing, raising some of the sub-soil, is one of the best remedies that can be adopted. We are, however less subject to have our crops lodged in this country than in England, because we have a drier season. The application of lime to the soil would, I have no doubt, be a great improvement, where it does not already exist in the soil in sufficient quantity. The straw of grain crops will not be strong where the soil does not contain some lime in it—naturally or artificially supplied. There is one circumstance certainly in favor of the system of husbandry which I have been finding fault with, that the crops will seldom become lodged from luxuriant growth.

Perhaps more has been done within the last few years by the Government and Legislature of Canada, for the encouragement of agricultural improvements, than has been done for a similar object, by the Government or Legislature of any other country on earth. About twenty thousand pounds currency has been annually appropriated to this object, under two excellent Acts of the Legislature. There are 57 agricultural societies now organised in Lower Canada, in conformity to the provisions of one of these acts, besides three of the counties that have not any agricultural society. I suppose an equal, if not a larger number of societies, are organised in Upper Canada. Some of the Societies of Lower Canada, I am sorry to say, have not subscribed sufficient to entitle them to receive the full amount appropriated for each county, and £750 is also unappropriated, in consequence of there being no agricultural societies organised in the counties of Kamouraska, Portneuf and Montmorenci. The agricultural societies have the expenditure of these liberal and ample funds, except 10 per cent reserved in each section of the province for holding an annual agricultural and industrial exhibition. It would be almost impossible that more liberal and judicious encouragement could be given. The agri-

culturists of the country have the complete management and disposal of these funds for the encouragement of agricultural improvement, and certainly it would be only reasonable that the Government and Legislature would expect that improvement was making rapid and satisfactory progress, and that every possible means was being adopted to put an end to any defects in our system of husbandry. Nothwithstanding the numerous defects I have pointed out, as still existing in our system of husbandry, I admit with great satisfaction that improvement in agriculture, though not general, is making very considerable progress; but all true friends of Canada must wish to accelerate this progress and see it more general. County agricultural societies are the proper medium through which general improvement should be introduced. The defects in our system of husbandry must be known to them, in whatever department it may exist, either in the cultivation of the soil or the management of live stock; and it is the duty of these societies to encourage farmers to introduce the changes and improvements required, or the public money which they annually receive for this purpose is little better than wasted.

It is a question of considerable importance that the Government allowance to agricultural societies should be so employed as to produce the greatest amount of real improvement where it is most required,—and it would appear that the establishment of one or two "Economical Model Farms," by each society, in conformity to the provisions of the Act 16 Vic., chap. 18, sec. 9, would be one of the best means that could be adopted for the remedy of the defects that exist—particularly in the Seigniorial sections of Lower Canada. The general introduction of some regular course of rotation of crops, is one of the first improvements required — next to sufficient draining and good ploughing. It is out of the question that we can have good stock, or good crops, unless by chance, until we establish a regular rotation of crops, where the land will be cultivated properly and crops of various kinds succeed each other, and the soil receive a thorough breaking-up and cleaning, either by hoed crops or summer fallow—once in each course of rotation and never be let out of tillage without being seeded down with clover or grass seeds. When we have our farms judiciously sub-divided, well-drained, and under a regular rotation of crops, we may then expect to have good stock—but not before.

If one or two farmers could be induced in the limits of each agricultural society, to establish a judicious plan of rotation and cropping, and general good management of land and stock, prizes might be awarded—suppose £50 to the best, and £25 to the second best annually—during the working out of the rotation agreed upon, provided it was continued to the end, executed systematically and in a proper manner. The farms to be inspected at least four times in the year by two or three competent judges, duly appointed by the society. Of course due regard should be had to the suitableness of the farm to be selected for the experiment. I cannot see why there should be any difficulty in establishing and carrying out this plan satisfactorily. As I before observed, any changes that would be introduced in our system of husbandry should be profitable, or they could not well be considered as desirable improvements; and admitting this view to be correct, the plan I suggest would be to award two prizes of £50 and £25 to any two farmers who would have the courage and patriotism to break through long established habits and modes of cultivation preven defective and unprofitable, and adopt a system acknowledged to be better and more profitable, by practical experience, It will be imagined that there should be no necessity to pay a farmer for doing what it would be for his own interest to do; but as it is a well established fact, that farmers who have not received a liberal education are not fond of trying experiments, or changing from old habits, it would be necessary to hold out some pecuniary reward to them to adopt the plan proposed, however much it would ultimately prove for their actual profit. The amount of the prizes I propose may be thought insufficient, but I hope there is not a county in Lower Canada where two or three farmers may not be found to make the experiment suggested. The prizes continued for five or six years would pay for any extras that might be required in order to have the farm and establishment worthy the object sought—to be a pattern for others, and to prove the advantages of a regular and judicious system. The farm should be judiciously sub-divided, fenced and drained, and all the other work of the farm carried on in the most economical manner. Unless the farm was conducted and managed in such a manner as to show other farmers that they may adopt the same plan without inconvenience or difficulty, the "model farm" would be utterly useless.

A model farm on a large scale would not, I fear, succeed well in Lower Canada at present, and might turn out to be only a "bad job." No doubt an agricultural school with a model farm attached, established in each county, would answer a good purpose, provided every

department was properly conducted; but this is not so easy a matter, and might be found a more expensive machinery than would be compensated by the amount of good produced. At all events the municipalities might take the matter up, and establish such institutions if they consider that they are advantageous. I propose that we should make the best use of the funds already at our disposal in the hands of the agricultural societies; that they should establish with a part of their funds, what would answer as model or pattern farms, to show the working and prove the benefit of adopting a regular rotation of crops, proper cultivation, and the judicious management of live stock. I do not pretend to lay down the rules and regulations necessary for these farms; this part of the business will be best understood and managed by the agricultural societies. I shall however, in my next communication suggest a course of rotation of crops, which may be modified to suit peculiar circumstances and localities. It may be replied to my proposition that there are already many farmers in the country that practice a regular rotation of crops and farm exceeding well, and that these might answer all the purposes of model farms. No doubt of this fact; but, nevertheless, improvements are required in every department of agriculture. A part of the public funds appropriated by the Legislature, might be devoted to encourage improvements in the defective system of agriculture prevailing to so great an extent in the seigniories of Lower Canada, and by establishing a pattern farm carried on in the midst of them, sanctioned and approved by agricultural societies chosen by themselves, it would not fail to produce a most salutary effect where it is the most required. Farmers will not always close their eyes to improvements that are proved to be practicable and profitable, particularly if proven so by establishments such as I propose, and to which they should have at all times free access. If a regular rotation of crops were to become general, and no land let out of tillage without being thoroughly cleaned, and seeded down with clover or other grass seed, we should not have any more of these most unprofitable wastes, producing nothing but weeds and natural grasses. I do not object to natural grasses when they replace artificial ones where the land remains in grass for several years; but where these natural grasses have only one season to grow until the land is again ploughed up, they cannot be of much value. There are some lands in Lower Canada, where the soil is of such superior quality, that it becomes naturally covered with white clover the year it is not in tillage and affords a very good pasture; but this is not generally the case, and when the season happens to be dry, the land does not produce much natural grasses, when only out of tillage for one year.

I cannot better conclude this communication than by copying a paragraph from a late number of the Mark Lane Express: —

"Climb higher, and yet higher toward the summit of moral, intellectual, and industrial perfection, until every occupier of land becomes a man of science, every farm the laboratory of a practical chemist, and every field exhibits the neatness, regularity and productiveness of a well managed garden."

It is very satisfactory to be able, in my first Agricultural Report for this year, to congratulate farmers on the very favorable commencement of spring, succeeding a stormy, and rather severe winter. From the middle of April the land has been generally in good condition for agricultural operations, wherever justice had been done to it last fall, as regards ploughing and draining,—and on well managed soils, sowing might have been commenced shortly after the middle of April. The snow passed off this year without producing any flooding, and land properly drained was soon in a dry state for sowing, and there was scarcely any rain up to the 18th instant. Meadows and pastures have not suffered injury by frost, as they did last year; but lands seeded down last spring have not succeeded very well, in consequence of the drought of last summer; and in many cases from the weight of the grain crop, where the land was very fertile, the young clover and timothy plants were destroyed for want of space and air. The spring has been cold and dry, and hence very favorable for sowing and planting, which should now be in a forward state towards completion, with the exception of wheat sowing, which, in order to escape the ravages of the wheat fly, is generally put off to the last week of May and first week of June. This year, however, some farmers have ventured to sow wheat early, when they had an opportunity of doing so in April; but the weather has been so cool, that the young plants have not made much progress yet, and should the early sown wheat not come into ear previous to the first of July, it will probably be more or less damaged by the fly. With all the injury to be apprehended from this insect, I would venture to sow early, provided I could do so previously to the 15th or 20th of April, as I have very frequently done for several years after I first came to Canada. It would appear that, for the last 20 years, the sowing time has not commenced so early as for the previous 18 years. In the first period, I have frequently sown wheat from and upon the 1st to the 15th of April, and it was considered very late indeed if sown after the 1st of May. Of course, we then had only varieties of wheat, which required four months to mature from the time of sowing. Now, we have got varieties

which mature in three months from the time of sowing, or we should give up cultivating wheat. Our climate must, undoubtedly, be very favorable, when in three months from the day of sowing, a very good crop of wheat may be harvested, producing from three to four quarters of good grain, or from 24 to 32 bushels per acre, which I have known farmers to raise here, by proper cultivation and management; and if one farmer can do so, what is to prevent others doing so? To obtain favorable results in agriculture, every act of husbandry must be done well, in the right manner, and at the right time; and in order to be able to accomplish this, the best implements, the best and cleanest seed, sound practical experience in the art of agriculture, and close personal attention, is actually necessary,—and without all these qualities combined, and in action, we need not expect large products from our lands. I have not had sufficient opportunity this spring to see what progress has been made in sowing and planting, but I know there has been a favorable time for both these operations, where anything like justice has been done to the land last fall; and at this date the spring work should be very far advanced, with all agriculturists who are desirous to "do the work well, in the right manner, and at the right time." Peas, beans, oats, barley, Indian corn, vetches, potatoes, carrots, parsnips, mangold wurtzel, might all be sowed from the first moment the land was in good condition. There is no injury to be apprehended from sowing all these crops as early as the soil is in a fit state to receive the seed. When the soil is in a good state of preparation before sowing, and left properly drained after sowing, the agriculturist has done his part so far, and he may confidently hope for favorable results; but he must not relax his attention, or neglect the after cultivation and weeding that may be necessary, until the crops are at maturity. It will be fortunate for those farmers who have availed themselves of the dry weather to sow and plant all they could, previous to the late change to rain. At this period of the spring, it is quite necessary that most part of the work should be finished, and that we should only have the wheat to sow. In our rather short seasons, the seed should be put into the soil as early as it is possible and expedient to do so. In preparing wheat for sowing, the seed should be steeped in a strong pickle of salt and water, the grain frequently stirred, and the light grains skimmed off and separated. After steeping a few hours, the wheat may be drained out of the pickle, and dried with lime, gypsum or wood ashes, before sowing. The clover and grass seeds should be sown after the wheat has obtained the first harrowing, and these seeds should be also harrowed in with a light harrow. If guano is applied, it is considered a good plan to harrow it in with the wheat. The quantity should be about two cwt. to the acre, previously mixed with double that quantity of salt, if conveniently procurable at a fair price. If salt cannot be had, wood ashes might be substituted. This application would be rather expensive here; but if the land is sufficiently fertile, there is no necessity for guano. To sow wheat, however, where there is not sufficient fertility in the soil to produce a good crop, is a very unprofitable practice. In a good system of agriculture, crops are not attempted to be grown, unless the land is in a proper state of preparation to produce a fair crop; and the sooner we adopt the same general rule, the better it will be for us. As much as from 10 to 20 tons of farm yard manure, and from 2 to 4 cwt. of guano, is applied to the acre of land for root crops in England, and frequently half a ton of guano, without other manure, to the acre for potatoes. Guano does not produce much effect when its application is succeeded by very dry weather, and therefore, in top-dressing cultivated crops, or grass land, it should, if possible, be applied during rain, or immediately before it. It is, however, nearly useless to apply guano to crops where the land is not properly cultivated and clean, and it is as hopeless to expect good crops of wheat on five-sixths of the land that is sown with that grain in Lower Canada, under the present usual system of cultivation for it. Farmers may imagine they grow fair crops when they are very deficient from what ought to be considered a fair remunerating crop. Wheat is a grain that requires that the soil should be clean and properly cultivated for it, and we need not expect to raise heavy or remunerating crops of it where the land is not in a proper state of preparation. Buckwheat should be sown as soon as possible after the other crops are finished. Last year a large portion of the crop was destroyed by early frost. It is said to be a good crop to sow clover and grass seeds with, to lay down land. Great attention is necessary to have the furrows and drains in all cultivated fields well cleaned out, and when the time arrives for weeding, that there should not be a weed suffered to remain in the crops. It should be the farmer's delight to do all in his power to give his crops a fair chance of succeeding; and when he has done this, he may confidently hope and trust in the goodness of the Creator for favorable results in the harvest. The farmer who cultivates well, does so in confidence and hope that an abundant return will reward him fully; but the careless cultivator appears to have no hope that his toil and care would receive any reward, and therefore expends the least possible amount of labor and care upon his land and crops, takes his chance, and is quite content with the return, whatever it may be. I hope the season may continue to open as favorable as its commencement up to the present time, and we shall have abundant cause to be thankful

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I did not intend to continue this subject after my last communication, but circumstances have occurred that has induced me to make an addition to what has already appeared.

In looking over Agricultural Periodicals, and other papers, which I receive from the old country, I cannot help observing, that we have not the same advantages here for promoting Ag

cultural improvement which they possess in the British Isles. In those countries the most eminent talent and scientific skill is engaged, and liberally paid, to study and explain the best means that can be employed for advancing the improvement of husbandry. These able men give public lectures upon the most important questions of Agricultural practice, discussions take place, and questions are proposed and replied to. These lectures are given at the great annual meetings of the National Agricultural Societies of England, Ireland, and Scotland. The English Society of Arts, the Royal Dublin Society, the Smithfield Farmers' Club, and at many provincial Agricultural meetings. At these meetings the audience is composed of noblemen, gentlemen, and farmers of education, who are able to appreciate what is submitted for their consideration, and who are not slow to act upon any suggestion and recommendation proposed, which appears to promise to be advantageous. If we have not here, at present, the advantage of hearing Agricultural lectures and discussions, we can, nevertheless, profit by them as they are reported to us from our native land; and we have the further advantage, that improvements proposed by lecturers, if demonstrated satisfactorily, have been put into practice, their merits fairly tested, and the results ascertained, so that we need not incur any risk by adopting improvements already successfully tested. It has been constantly my object in all my Agricultural communications, to bring under the consideration of farmers in Canada, Agricultural improvements that have been successfully practised in other countries. I know that I may have opportunities of hearing of these improvements, that other farmers have not, and it is my desire that they should be made acquainted with every improvement that is being introduced in the first Agricultural country on earth. It is no advantage to me that I should do this, if I was not anxious that Agriculture should attain to a high degree of perfection in Canada; and there is nothing more annoying to me, than to see some of the finest lands in the world, not producing half the crops they are capable of producing. It is not Agriculturists alone, or even the inhabitants of any one country, who are interested in the success of Agriculture—the whole population of the earth, however variously occupied, are deeply interested in Agriculture, and that it should be so conducted in every branch and department, that the lands should produce the greatest possible quantity, and of the best quality, for the use of mankind. People talk of commerce and trade as if they were the source of all wealth, and the only object worth the ambition of all educated classes, that are not proprietors of landed estates, and they also appear to suppose that commerce and trade must precede agriculture, instead of following it. Commerce and trade has unquestionably been extended and increased within the present century in most civilized countries, but more particularly in Britain—her widely extended Colonies, and in the United States, and vast fortunes have been acquired in the lottery of commerce and trade, and this success of a few, has acted as an attraction and encouragement to young men of education to venture in this uncertain lottery rather than in agriculture, when there were very few *large* prizes to be gained There is, I believe, a very prevalent mistake in regard to the real cause of the extension of commerce and trade within the last fifty years—and parties confidently attribute it altogether to the skill, industry, and enterprise of those engaged in trade and commerce. I am convinced, however, that so far as regards Great Britain and her Colonies, and also the United States, the great increase of trade and commerce is solely to be attributed, and is the consequence of the vastly augmented production of agriculture and population in the British Isles--in the widely extended Colonial Empire of Britain and in the United States, with whom Britain has large commercial transactions. The increased productions of the lands of Britain and her Colonies, and of the lands of the United States, within the last 30 or 40 years, is fully equal to any increase of trade and commerce within the same period, however great the latter has been. These are facts that are not generally brought forward so prominently as facts relating to the increase of commerce and trade, though the latter facts, most certainly, are produced by the farmer, and depend altogether upon their existence. The produce of the soil, created by the skill and labour of agriculturalists, is the only true source of all wealth, and commerce and trade can only be healthfully extended and supported, in proportion as these products are augmented in quantity and excellence. I mention these circumstances, which I believe to be incontrovertable, in order to shew that the merchant, the manufacturer, and the whole population, not only of this, but of every other country, are *indirectly* interested in the improvement of agriculture, as much as those who are directly engaged in that occupation. A country of scanty production can never be rich or flourishing, or have either trade or commerce, unless all her inhabitants are manufacturers; and if so, they do not require to occupy large tracts of land, but exchange their manufactures for the products of the soil of other countries. Many of the cotton lords of England, whose vision and ideas were confined within the width of their extensive manufactories and of their great bales of cotton, have endeavored to convince the people that England might not only exist, but prosper and flourish, independent altogether of her agriculture, when at the same time the annual value of the agricultural productions of the British Isles were five times as great as the value of manufactured goods annually sold to foreign consumers, and when British agriculturalists were the principal customers for manufactured goods sold in the British Isles. These subjects are, however, becoming better understood and appreciated, now that the occupation of the Corn Law League is all over, and agriculture is in a very different position from what it was a few years ago, not only in

England but in Canada, and I confidently hope that it will, very soon, by general consent, attain fully that position here to which it is entitled by its importance above all other occupations.

At the late Paris Exposition of the productions of all Nations, the products of the soil of Canada attained a deservedly high character, and proved, beyond all doubt, the capabilities of the country for successful agriculture. The products contributed by farmers to send to Paris, were those resulting from good husbandry and skilful daily management, and although equally good products might perhaps be furnished by many other farmers, yet, those who did contribute them, were entitled to the thanks of the community. Canada would have made but a poor figure at the Exhibition, if it were no' for the productions of her soil, her woods, and her minerals that were sent. It would have been impossible to puff her up to her present position, if her products were not there to speak for themselves. I was delighted to see the remarks in reference to Canada and her products, by Mr. Denison, M.P., Vice President of the International Jury of Agriculture, at the Paris Exhibition, in his Report to the President of the Board of Trade, &c., Lord Stanley, of Alderley. After a few favorable remarks in reference to the steam plough of Mr. Romain, he goes on to say:

"Besides taking the lead in promoting cultivation by steam, the Canadian Legislature voted a large sum of money (£10,000 currency) for the general object of the Exhibition, and sent some good machines, and a magnificent collection of products.

"The Exhibition of 1851 brought favourably into notice the great resources of Canada, increased the general confidence in the security of sums invested in its public works, and facilitated the introduction of capital into the colony. The display which was made at Paris cannot fail to fix on broader and firmer foundations the confidence in the natural resources of the colony, and the intelligence and public spirit of its inhabitants."

This is saying a good deal for Canada, by such a man as Mr Denison, a great agriculturist, and for many years a member of the British Parliament. There is so much of Mr. Denison's Report so very interesting, that I am induced to copy some further extracts from it. The letter of instruction from the President of the Board of Trade to Mr. Denison, was: "That he would furnish a Report, to be laid before Parliament, of the position which the United Kingdom held in the Paris Exhibition, compared with foreign countries, in the class of agriculture, and the progress, if any, which has been made since 1851, in respect of this class of objects." Mr. Denison remarks, that as the comparison is very favorable to Britain, he prefers employing the words of a French author, rather than make use of his own. It is a remarkable circumstance, that many of the acknowledged defects in the agriculture of France are also prevalent in Canadian agriculture, as will appear from the following selections which I copy from the Report. The author quoted by Mr. Denison is a French gentleman by the name of Leonce de Lavergne, and his work has gone through two editions in France, and has been translated into English. The French hectare is something less than two and half English acres, and over two and three quarters Canadian arpents. The weight of the kilogramme is about 2¼ lbs. English:—"Systems of Cultivation.—France has devoted itself too exclusively to the production of corn crops, which are the immediate food of man, without sufficiently considering the means necessary to uphold the fertility of the soil under this exhausting process. England, on the contrary, has been led, partly by the nature of the climate, partly by design, to take a sort of by-path, which reaches corn crops, through the intervention of green crops; finding, in the rearing of cattle, and the supply of manure, the restorative process which is necessary. The experiment has entirely succeeded, and is extending itself day by day; and the remarkable fact is, that in proportion as the head of cattle increases, the quantity of corn increases also; the grain in intensity exceeds the loss in extent. * * * "The British Isles produce more food for animals than the entire surface of France, of double the extent. Hence, the supply of manure is, in proportion, three or four times greater in Britain than in France." He goes on to say that the produce of grain in England is more than double per acre what it is in France, "and three times more in saleable value." He says that if France produced in proportion to England, she would produce more than double what she does at present. Again: "Taking all products into account, animal and vegetable, it appears that the produce of England per hectare, is nearly double that of France. The great lesson which these figures teach, beyond the disproportion of the results, is the relation of vegetable to animal products. In France the vegetable products form four-sixths of the whole, and the animal products two-sixths only; showing at first sight an exhausting cultivation, and one at least stationary. In the United Kingdom, the animal products are equal to the vegetable. Thus, the animal products alone of an English farm are equal to the entire products, animal and vegetable, of a French farm of the same extent."

"Sheep.—The most remarkable feature of British farming, in comparison with that of France, is the number and quality of the sheep. According to statistical returns, the number of sheep in France and England is about equal, 35,000,000." He says that if France had the same proportion as Britain, she should have about 60,000,000; and further, he states that England supports three times as many sheep, in proportion, as France. "But this great difference is in the quality of the sheep, upon the breeding and improving of which, with a view to weight and early maturity, so much care and attention has been bestowed. The weight of the English sheep is twice that of the French sheep; so that an English farm on an equal surface, gives six times as much mutton as a French one."

"Horned Cattle.—In the case of cattle, the same care in breeding from selected animals in the United Kingdom, and continually improving the races, in studying meat producing qualities and early maturity, has effected results similar to the results produced in sheep. France possesses 10,000,000 head of cattle; the United Kingdom, 8,000 000. In France, three products are demanded from cattle—labour, milk and meat. In England, only two—milk and meat. The yield of these two valuable productions is materially interfered with, by requiring work also from cattle." * * * The habit of labour forms hardy, vigorous races, which, like men devoted to hard work, eat much, fatten slowly, develope their bony structure, make little flesh, and make it slowly. The habit of inaction, on the contrary, forms races gentle, tranquil, which fatten early, assume round and fleshy forms, and give, with equal food, a far larger yield to the butcher. If we look to labour, the ox is killed when he has finished his task. If we look to meat, the ox is killed at the moment when he yields the largest amount. Cattle in France are killed too young or too old; among the 4,000,000 head killed, figure 2,000,000 calves giving each only 30 kilogrammes of meat, (about 67 lbs. English.) Those who survive are killed at an age when the growth has long ceased—that is, when the animal has long been consuming nourishment which has not added to its weight.

"In England, on the contrary, animals are killed neither so young, because in their youth they make the most meat, nor so old, because then they make none. The moment is seized when the animal has reached his maximum of increase.

"In France, the number of animals killed annually is about 4,000,000 head, averaging about 100 kilogrammes (or about 225 lb. English) per head. In the United Kingdom, the number killed is about 2,000,000 head, producing of meat, on an average, 250 kilogrammes each, or about 562½ lbs. English each.

"Thus, with 8,000,000 head of cattle and 30,000,000 hectares of land, British agriculture produces 500,000,000 kilogrammes of meat; while France, with 10.000,000 head of cattle and 53,000,000 hectares of land, produces only 400,000,000 kilogrammes of meat."

The foregoing remarks on the live stock of England and France, are well worthy of the attention of farmers in Canada, and it is not necessary for me to say more than recommend them to their serious consideration.

The experiment with ploughs was very interesting. The ploughs made by Howard and by Ball, England, appeared to be the lightest draught, but the plough of Ransom and May, England, is reported to have done very good work; though the land was rather harder, it was next to the ploughs of Howard and Ball in lightness of draught, and it turned a deeper furrow than Howard's plough. The two ploughs sent from Upper Canada were much heavier of draught than any of the English ploughs. The following remarks on the experiment with ploughs, I beg to submit:—"It was objected against the English ploughs, and, indeed, against the English machines in general, that they were too heavy and too costly, but the trials showed that a light plough does not always make light work, nor is an implement cheap at first cost, always cheapest in the end. The same objections against iron ploughs, and in favour of the old wooden ones, have been freely made at home, but they are passing away under a long experience. To do good work in the field, you must have strong and well constructed implements. The best implements are the cheapest in the end, they are fast superseding inferior implements at home, and they will, no doubt, in time, receive the same preference, whenever they shall be put fairly to the task. The value of solidity and strength was fully recognised in the implements akin to ploughs—drags, scarificers and broad-shears, by which so much of the labour on the best conducted farms is done effectually." In reference to draining the report says:—"It is understood now that draining, not only keeps the land drier during the rains of winter, but keeps it cooler and more moist during the heats of summer, preventing the baking of the surface by the sun, and promoting the constant progress of vegetation. It is the foundation of all improvements—the first step in the path of good cultivation." I believe the draining is not much practiced in France, and it appears that on the importation of English tile machines into that country, there is a very heavy duty. And this heavy tax upon English tile machines acts as a discouragment to tile making, and retards draining in France for the present.

Agricultural Products.—Under this heading I shall only give the following extract:—

"Amid all the beautiful specimens of wheat from Algeria, from Australia, from Van Diemen's Land, from Canada, it was admitted that no single specimen equalled in excellence the specimen sent from South Australia to the Exhibition of 1851. It does not appear from the information that has reached me, that these fine grains, sown in this country, retain the excellence of their original type. Grains matured under a hot sun form, according to the commonly received opinion, the most valuable seed; but in the case of wheat, the practice seems to be the reverse of this. It is certain that our strong and prolific wheats are imported largely into France for seed. Not less than 5,000 quarters (40,000 bushels) were imported early in last autumn for this purpose. These strong and coarse wheats, no doubt, refine in color and in quality under a more southern sun. It does not appear that the exchange of the fine grains of the south to our northern latitudes, is attended with results equally advantageous. It would be desirable that some careful experiments should be made, to induce to greater certainty on this point of so much interest."

These latter observations are deserving of consideration by Canadian Agriculturists, who may be desirous of experimenting on new seeds. I sowed some Australian wheat of beautiful

quality, and it progressed most luxuriantly until it came into ear, and was then completely destroyed by rust. I have never seen any other wheat have the same luxuriant appearance as the Australian during its progress until it came into ear, but then it failed. I, however, made only one experiment, and that is not sufficient to ascertain how it might succeed in Canada, I have been always under the impression that seed wheat from southern latitudes, and when there is not much rain in summer, will not succeed in more northern latitudes, and where considerably more rain falls during the summer and autumn.

I come now to that part of Mr. Denison's report, which refers to the interesting question — "What progress has been made since 1851," in the agriculture of Britain. Mr. Denisons says:—"A reply may be confidently given that progress has been made on every side. In Machinery, in scientific acquirements, in field practice, and to such an extent the productive powers of *B*ritain have more largely increased within the last four years than they have within an equal space of time at any former period. In machine making, though some interesting novelties have appeared, the characteristic feature has been the constant improvement tending to perfection, of our established implements, and a great extension of their use through the body of the farming community, a fact significant of the superior intelligence which is now brought to bear on farming affairs, promising a sure and constant progress.

First on the list in point of interest, first in its remarkable increase, stands steam machinery. It was a very remarkable thing, that in the year 1851 our firm, Clayton & Shuttleworth, of Lincoln, a firm not known to the agricultural world ten years ago, should have sold in one year 140 portable steam engines. Since 1851, the annual progress has been as follows:—1852, 243 engines; 1853, 293 do 1854, 263 do; 1855, 491 do; in all 1390—having an aggregate horse power of 8701, or an average of nearly seven horse power per engine bring an increase of power equal to two horses on each since 1851" Mr. Denison says that 90 per cent of those engines were sold to agriculturists. He mentions another circumstance that Messrs. Garret, have sold to one foreign customer from Hungary, not less than £8,000 worth of agricultural machinery, and many other machine makers have sold a large amount of implements to foreign customers since the Paris exhibition. The demand for improved implements by English agriculturists is rapidly increasing every year. Mr. D. observes:—"It may be imagined by some that too much stress is laid on the value of improved implements. It may be worth while to examine the point more closely."

He then makes a calculation that the saving by the use of good implements, and drained land, is equal to 8s. 6d. per acre in every way upon a farm of 200 acres—or one third of the rent—say 25s. per acre. He says that the difference in labor by ploughing drained, and undrained land is very great. The greatest improvement in cultivation and management have taken place in strong lands.

Draining is the cause of all these improvements. Draining now better understood and generally well executed in sufficient depth, has changed the character of whole districts turning unmanageable and unprofitable soils into easy worked and productive soils. * * * Draining operations are carried on by means of the public loan, the capital of private companies and individual proprietors. Of the loan of £4,000,000, the sum issued for works in each of the last three years have been —1852, £410,476; 1852, £318,637; 1854, £322, 7 8; total £1,051,813." Mr. Denison thinks that lands drained by the public would not be more than one-fourth of those drained by private capital. And in that case the total sum expended in draining for the last three years would be £5,257,615, and allowing £5 as the expense per acre it would exceed 1,000,000 acres drained. Here is an example. We know how vastly thorough draining improves strong clay land particularly, and how land in England, that was not worth 2s. 6d. per acre, has, by thorough draining become some of the most valuable and productive land in that part of the country. I am convinced that thorough draining properly executed in Canada, on a large portion of our lands, would have an equally beneficial effect. Want of sufficient draining is in this country one of the most injurious defects in Agriculture. In England they consider it the first and most profitable of all improvements, and the want of it the greatest defect and loss to the Agriculturist; and from my own observation, I am persuaded, that draining should be regarded in the same light in *C*anada. In the British Isles, where great land proprietors are generally wealthy, Parliament has, nevertheless, loaned a very large amount for draining.

If such aid was considered necessary in Britain, how very much more necessary is it in *C*anada? and it might be as safely loaned here as there. I met a gentleman in May last, who told me that £50 which he had received from Government last year for distribution to farmers in his parish for the purchase of seed, had been all returned except a small amount which he expected soon. and he ex-

pressed great satisfaction that he should have it in his power to return the full amount to the Government. I do not know how it may have been in other parishes; but I do not think that money loaned under similar circumstances, in any parish in Britain, would be so promptly returned. Though I may be very candid in pointing out defects in Canadian agriculture, I am delighted when I have it in my power to report any circumstance that is favorable to Canadian Agriculturists. I do not think it would be possible to find in any country on earth a better disposed or a better conducted rural population, than that of Canada. The only fault I ever could see in their character, was their backwardness to introduce the improvements necessary in their system of husbandry, and improvements that could not fail to be advantageous to them.

As a further proof of the progress which Agricultural improvement has made since 1851, Mr. Denison alludes to the vast quantity of Peruvian guano imported by Messrs Gibb of London, for the last three years:—"1852, 118,000 tons; 1853, 105,000 do; 1854, 177,000 do, making in all 430,000 tons by one house. Allowing £12 per ton for cost and carriage, the sum expended amounts to £5,160,000. To this must be added the large outlay on linseed cake, on bones, rags, on minerals containing fertilizing principles, on lime, on plaster, &c. With these combined efforts on the part of the owners and occupiers of the soil, there can be no danger in asserting that the productive powers of these Islands have largely increased, and are continually gaining new force."

Mr. Denison in speaking of Agricultural Chemistry, names several able chemists who by their investigations and experiments during the last few years, have done much for Agriculture. There cannot be any doubt that the publications and lectures of the late Professor Johnston, of Baron Leibeg, Lawes, Way, Nesbit, and many others, have had a most beneficial influence upon Agriculture, and were the means of enabling the former to connect science with practice in the cultivation and management of his animals and his crops.

The results of the great Exhibition of 1855 are highly flattering to Agriculturists of the British Empire, and quite fully sustains the opinion I submitted in a former communication that the productions of agriculture both animal and vegetable, had attained a greater perfection, compared with the agricultural productions of other countries, than any other productions of the empire had attained, compared to the same class of productions of other countries. The advice of Mr. Denison at the conclusion of his report, is well worthy the attention of the agriculturists of Canada as much as those of the British Isles.—"We call upon the farmers to continue and increase their efforts; so alone will they be able to keep pace with the demands made upon them by a population ever increasing in numbers and in wants, and to maintain the place in the front rank which they now honorably hold."

It should be very satisfactory to Canadian agriculturists that the products of Canada at the Paris Exhibition have been found every way worthy of this the first colony in importance,—of the first agricultural country on earth. This is a position we may well be proud of—and now that we have attained this high position, we are inexcusable if we allow a defective system of husbandry to prevail in Canada. The agricultural products both animal and vegetable and the agricultural implements of Britain, have attained the highest place, "the front rank" in the general products of the Empire, and there is no doubt they will always maintain that rank. The agricultural products of Canada at the Paris Exhibition, were described by a most competent judge as a most "magnificent collection," and this collection was not selected from farms that were of superior quality of soil, or from any particular section of the country that was favoured by a superior climate above the general climate of Lower Canada, but unquestionably they were obtained from farms that were well cultivated, and under a good system of management. Our greatest ambition should be to bring our general system of husbandry to that degree of perfection, that at any time we might make a "magnificent collection of products" taken by lot, from all sections of Lower Canada. It is no advantage to the farmer who annually obtains a scanty produce from his land and labour—who hears of and knows to a certainty that other agriculturists obtain annually large products under similar circumstances as regards climate and the natural quality of the soil—unless he endeavours to understand the cause of this difference and removes or cures the defects in his own system of husbandry. A good example is advantageous for instruction, if we endeavour to learn by this example, and adopt improvements which we perceive to be beneficial and profitable to those who practice them. Skilful agriculturists may come to Canada and settle there for their own special advantage, but there is no doubt that their doing so, and introducing the practice and example of a good system of husbandry, is

every way calculated to confer a great benefit upon the country, if farmers who require instruction will only follow the example of good husbandry so far as it may be manifestly profitable for them to do so.

I am more and more convinced every day, that in order to check the growth of weeds in Lower Canada, a regular rotation of crops must be observed, and worked out carefully and strictly. Without this regular rotation and thorough cleaning of the land at certain intervals, we cannot subdue the weeds, or prevent them being very injurious to cultivated crops, and to meadows and pastures. Thistles, wild peas, wild mustard, crows-foot and the ox-eyed daisy, prevail to a great extent in many farms and localities, and unless we can check them, they will be sure to extend every year by the falling of their seed upon the soil, and by mixing with the manure. I believe it to be necessary that where there is any chance of seeds of these weeds mixing with the manure, this manure should not be made use of, until by active fermentation the vitality of all seeds that might be mixed with it, would be completely destroyed. I have experienced the injury of top dressing with town manure not properly fermented. No doubt there is a loss in allowing manure to ferment very much before using it, but while seeds of weeds are allowed to mix with it, or while these seeds are by any means brought into the farm yard, their vitality must be destroyed previous to the manure being applied to the soil in any way. We cannot keep our lands clear and in profitable condition by any short cut process. If we wish to subdue bad grass and weeds, we have to destroy them thoroughly in the soil before we lay down our lands under new grasses, and this can only be done by a regular rotation of green crops, &c., by summer fallow properly executed or by burning the surface, and the roots of all bad grasses and weeds, which have to be carefully collected by the grubber, the harrow and by hand picking. I do not think we are yet in a position in Lower Canada to grow a sufficient quantity of green crops to keep our lands in good condition, and therefore it becomes necessary to resort to other means of cleaning our lands, and summer fallow will be found the most convenient and efficient, but that process must be commenced in the fall and completed during the succeeding summer, and if not properly executed by the utter destruction of all grass and weeds, it will not answer the purpose sought, or pay for the expense, and the loss of the land for one year. Tares, buckwheat, or other crops are sown for ploughing green into the soil as manure, but when this is done on soil very foul with weeds it cannot be properly cleaned, and the weeds are sure to grow again. There is no doubt, however, that to plough in a green crop as manure where weeds do not prevail, and other circumstances are favourable, answers a very good purpose, but the farmer must exercise his own judgment in all these cases. No farmer requires to be told that if weeds and grass are simply ploughed down with green manure, they will be sure to vegetate and grow up again. They must be destroyed, taken out of the soil, or buried so deeply, that they cannot vegetate. Adding manure while grass and weeds or their seeds or roots are in full vigour in the soil, only produces again grass and weeds in greater abundance, and while they are allowed to grow with our crops, we need not expect the latter to be good or profitable.

I presume it cannot fail to be very interesting to Canadian agriculturists to hear that in France, the nation with whom, fortunately Britain is now in close and friendly alliance, the improvement of agriculture is made a Government question, under the "Minister of Agriculture, Commerce and public works," and that the second "Universal Exhibition of Foreign and French Breeding Stock, Agricultural Implements and Produce," has just closed at Paris on the 7th of June instant, after continuing for 14 days. The encouragement offered as premiums were upon the most liberal scale, and the Government provided a free transport for foreign stock from the time they entered France, to Paris, and also their return from thence to a shipping port, besides providing provender for them and every possible accommodation, free of expense. I did not add up the premiums offered, but they must have amounted to several thousand pounds sterling. There are separated classes for the different distinct breeds of animals, both foreign and native, and the "General Regulations" are admirable. In fact, any one who feels an interest in the progress of improved agriculture, must be delighted to see the French Prize List, General Regulations, and all the ample and judicious arrangements made for carrying out successfully and usefully the great national Exhibition, so as to be worthy the great nation that has taken up the matter for the benefit of the people of France. This is unquestionably a move in the right direction by the Emperor of the French, and will be productive of more real benefit to France than all the wars she has ever been engaged in, however successful. The number of live stock and agricultural implements sent from Eng-

land, Ireland and Scotland, has been very large and Ireland gained 15 prizes on stock, and the gold and silver medal for flax and cereals. It was said that Her Majesty the Empress of the French became the purchaser of a beautiful Kerry cow belonging to Mrs. O'Reilly Dease, that had been awarded the 1st prize in her class £20, and the price of the cow was said to be from £40 to £50! A great number of prizes were awarded to British exhibitors for stock, implements, &c. The Exhibition altogether as I have seen it described, would have been worth a journey to Paris to have witnessed it. I believe the number of animals exhibited was over 3000.

From my long study of Canadian Agriculture, and my particular connection with it for many years, it appeared to me that an agricultural implement establishment, for the sale of the most approved implements as they came into use, would be very necessary towards the progress of agricultural improvement in this country. In the British Isles, such establishments are very numerous, and farmers have brought under their notice continually for purchase, the very best implements that can be invented and manufactured. Having no such establishment in Lower Canada notwithstanding the high character of our agricultural products, I was induced to endeavour to have this want supplied, and advised one of my sons to establish an agricultural warehouse and seed store, and he has had this spring a considerable assortment of implements and seeds, and by giving orders any implements in use in Britain or the United States, may be had with as little delay as possible, and at a moderate commission on the first cost and charges. The store is already supplied with imported English and Scotch ploughs of the most approved make, and an extensive assortment of samples of English implements are to be imported immediately. As, however, these implements are expensive, it would not answer any good purpose to import on a large scale, without a certain prospect of selling them. It affords me great satisfaction to have it in my power to acquaint the agriculturists of Lower Canada that there is an establishment of this description over the St. Ann's Market at Montreal, a central situation, accessible to all parts of the country, and any agriculturist who will take the trouble to visit the warehouse, will find that he can supply himself with implements, and with field and garden seeds of the very best description and quality, upon moderate terms. As regards hand agricultural implements, that are obtainable in this country there are not better to be had in any part of the world for lightness, excellent materials, and suitableness to the work to be executed. The advantages of a certain supply of implements, seed &c would have been highly prized here a few years back. These advantages are now in the farmer's power, and the success and usefulness of the establishment will depend upon the agriculturists of the country. When good implements are brought under the notice of experienced agriculturists, they are so well acquainted with their usefulness that they only require to see them to induce them to purchase. Hence it is, that good farmers will have all the good implements they require, while unskilful and careless farmers have such implements as are in accordance with a defective mode of husbandry, and a scanty produce resulting from this bad farming. This is a certain consequence of a defective mode of agriculture, that the implements of husbandry are inferior, and not the most suitable for executing the work to be done. The experienced agriculturist is sure of those implements that will do the work in the easiest, the cheapest, and the best manner, and this can never result from the use of inferior implements. One of the most certain evidences of the progress of improvement in agriculture in any country, is the general use of good and perfect implements, suited to their various uses. And as a proof of this, I may refer to the great perfection of the English implements of husbandry that are at this moment as superior to any of the world, as are the products of her agriculture and her domestic animals. I allude to these circumstances in order to remind farmers that good implements are a necessary part of good husbandry, and that such implements may be had to purchase almost at their doors. Guano of the best quality I believe, is also to be had at this warehouse in any quantity required, and any other fertilizing substances might be obtained there by ordering them.

The result of my experiments and experience of the present season, confirms the opinion I have always entertained, of the expediency, if possible, of early sowing and planting, as the best and most certain means of ensuring a favorable produce of crops in the harvest. Since the visitation of the wheat fly, farmers have found it necessary to procure a variety of wheat that only requires about three months from the time of sowing to bring it to maturity, and it has been the general practice in Lower Canada for the last few years, to defer sowing this wheat until the last week of May or the first week of June, in order to escape the fly. To this late sowing there are numerous and serious objections.

First, that the land remaining so long ploughed before it is sown, encourages the growth of grass and weeds, that are generally in the soil, and hence they commence to vegetate before the seed wheat is sown, and are always in advance of the latter until the crop is harvested. The second objection is, that at that advanced period of the season, the soil becomes dry and hard, and if the weather is very dry about that time, the sprouting of the seed is retarded, and the final success of the crop very uncertain. The sowing of clover and grass seeds at that advanced period seldom succeeds, which is another great disadvantage. I admit if we sow wheat, that the sowing must be deferred until after the 21st of May or later, perhaps, to escape the fly, unless we can sow it previous to the last week of April; and this I think is possible in most seasons. Early sowing did not this year prevent the damage which crops of barley and peas have sustained by the unfavourable weather through out the month of August, but this was an unusual occurrence, and late sown crops were just as liable to suffer damage by such weather as those that were at maturity at the time. Long continued rain in August can scarcely fail to produce rust, and lodge heavy crops of grain. And when this occurs while they are in a green state, the produce is never of much value.

Fife wheat was sown on the 18th and 24th of April for experiment, and although the month of May was cold and backward and unfavourable for vegetation, the crop is now harvested and scarcely injured by the fly, except in some ears of a different variety that happened to be mixed with the seed, and those ears are only injured in the extreme top.—This experiment convinces me, that early sowing, if possible to execute previous to the 21st of April, will be the best period for sowing spring wheat, and that the pure Fife and Black Sea wheat will be the best varieties to sow of any yet known in Lower Canada. I suppose many agriculturists have ascertained this fact to their own satisfaction: but those who have not, may rely on the experiment I report, as having been fairly made this year on land of light quality, well drained, but not under-drained, and no manure was directly applied to the crop. I know by past experience, that it is often possible to sow wheat and other grain in Lower Canada previous to the 21st of April, on land properly prepared the previous fall. I have sown wheat as early as the 1st, the 4th and 7th of that month, for three different years, and while we had only spring wheat that required four months to mature from the time of sowing, it was considered to be too late to sow after the end of April. Now that we have got a species of excellent wheat that only requires three months to mature from the time of sowing, early sowing would be very advantageous, and save the crop from much risk by rust or mildew, which is so frequently the consequence of late sowing when we experience such weather as we have had during the last fortnight. Early sowing is advisable for every crop we cultivate. Our spring never commences until April, and often not until nearly the end of the month. As our seasons must consequently be short, we should consider that the last day of May should terminate the season of spring, and the time for executing the spring work, otherwise our crops will not have a fair chance of the growing season. If the time of sowing and planting is allowed to extend into the summer, the crops have not the full advantage of the season though short it is, to come to perfection. Short seasons are urged as an objection to Lower Canada, but I think not very justly. The skilful Agriculturist will be able to manage his business so as to produce good crops and in good season. We may not always produce a general crop of wheat equal to agriculturists South or West of us, nor of Indian corn, but I have no hesitation in saying that Lower Canada will yield an average enviable produce, including every variety of crop cultivated, together with meadow and pasture equal to, if not of greater value annually, than any other agricultural country in North America. I presume that this proposition may be questioned, but I am confident I should be able to prove it satisfactorily. I admit that Agriculture is in a backward state in Lower Canada; but we have many examples of good husbandry to show what the country is capable of, and even in its present state, generally, is not much inferior to the general state of agriculture south or west of us. There are numerous defects in our system of husbandry; but defects exist elsewhere, though perhaps not exactly of the same description, but equally contrary to the rules of good husbandry.

When we perfectly understand our climate by past experience, we should adapt our system of husbandry to the climate and circumstances of the country; and if we are prevented from ploughing for several months in winter, it requires increased activity and industry in the spring, summer, and fall; and we should not forget to be thankful, that even in winter the frost and snow acts most beneficially upon the cultivated soil of the agriculturist, who ploughs and drains his land in proper manner. The farmers in England would be very glad if they could have the advantages we derive

from the frost and snow of winter upon the ploughed soil. We must be prepared to do the work in seven or eight months, which they have ten or twelve months to execute in other countries; but seven or eight months affords us a much greater number of working days than the same number of months does in other countries where there are many rainy days. We may have disadvantages to contend with but so have they in other countries, and although not of a similar character, they may be equally injurious to the agriculturist. By sowing and planting in the season of spring, we shall have all the summer to bring them to perfection, and by an early harvest we shall have a chance of more favorable weather and longer working time; and be able to commence our fall work sufficiently early to complete it in a proper manner, which never can be done if we have a late harvest that occupies all our attention until too far advanced in the season to admit of the judicious completion of the ploughing, draining, &c., which should be done in the fall, if we expect to sow and plant in time, or in a proper manner, in the spring.

The potatoe crop is very generally injured this year by the usual disease, brought on this year by the long continued rain in August. Perhaps no human precaution could have altogether prevented this loss, though I suppose it might have been diminished by observing more care in the selection of seed, and planting. When we succeed in raising a good crop, and frée from disease, of this useful plant, which we generally do when the season is dry, we flatter ourselves that the crop may be no longer liable to this disease and imagine there is no necessity for adopting any precaution as regards the application of manure, the selection of seed, or the adaptation of the soil for this root. The consequence is that when the seasons happen to be wet, we lose nearly the whole of the crop. The best soil for potatoes under present circumstances is that of light quality, stony or sandy, and always dry naturally, or by draining. When farm-yard manure is applied, it should not be placed in the drill under the seed, but be previously well mixed with the seed. Ashes, lime and salt are useful applications. Selections of such varieties of potatoes as are known to be the least liable to disease should always be made for planting. I have found that land ploughed after grass, though it increases the labour considerably to prepare the soil for the seed is best for potatoes, and that they are not so liable to rot when planted in such soil. The potatoe is a root, which though known for more than three centuries, yet it is only within the present century, that it has come into general and extensive cultivation all over the world, and every means adopted to increase its prduce to the uttermost extent it is capable of. This forcing may have produced a very great change in the nature of the plant, though we may not be able satisfactorily to account for it.

It would be a very geat advantage if every agriculturist endeavoured so to manage their buisness as to be capable of completing their harvest early in September. I would not propose this, if I was not convinced by experience that it was possible, even to finish the harvest in August, in ordinary seasons, and under ordinary circumstances. If excuses for late harvests are admitted, unless in very unusually adverse seasons, there is no use in recommending to sow and plant early. We know our seasons are short, and with the full certainty of this fact before us, it is absurd to expect to farm profitably, unless we sow and plant in such time as will give our crops the full advantage of the season allowed for growing and watering them. In some of the northern countries of Europe they have only a few days for spring sowing; and unless the work is completed in these few days, they do not and cannot expect to raise crops of any value.

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ADDENDA.

I have seen several reports of the late *P*aris Exhibition of live stocks, from which many interesting selections might be made, but I must forego the satisfaction of doing so on the present occasion. On the trial of implements the ploughs of Howard & Co., England, were awarded the first prize for deep cultivation, and Ranson & Co. first prize on ploughs for light cultivation. The whole proceeding at the Paris Exhibition, is a proof of the high estimation in which agriculture is regarded by the Government of France at the present moment, however defective may be the general system of husbandry which prevails, and I anticipate from the favorable disposition of the Government, that the improvement of agriculture in France will advance rapidly under the fostering care of Napoleon the 3d. There are some of the "general regulations" for the Paris Exhibition worthy of attention. Article 4th.—All animals shall be excluded which shall be considered in an over-fattened condition as well as those which have been purchased by agricultural societies or associations, or by general councils of departments and afterward re-sold by the said councils, societies or associations either by public or private sale.

Article 5th.—An exhibitor can only receive one prize in one category and sub-category when one category is divided according to the age of the animal, and for each sex; but he will be permitted to exhibit as many animals as he may think proper in each of the categories.

Article 6th—Animals for which prizes have been adjudged at previous general exhibitions in France, can only be allowed to compete again for prizes a degree higher than that which they had previously obtained. If such animals be shown for a prize equal to that previously awarded to them, they will be entitled only to the mention of that prize, without medal. If they be shown for only an inferior prize they will not be mentioned. In order to be identified, the prize animals will be marked.

Article 16th.—Gold, silver, and bronze medals will be awarded to the exhibitors of Agricultural produce, of which the merit shall have been established. The fresh mention of a previous award, will disqualify one to receive the medal. Exhibitors to whom awards have been made for grain or seeds of any kind, will be required to have a certain quantity of such grain or seed at the disposal of the administration.

The general regulations are not unlike those adopted by the board of agriculture for the Provincial Exhibitions here—and it is worthy of consideration whether the regulations copied above should not be strictly enforced at our *P*rovincial Exhibitions. Category is the same as section in our prize lists, and sub-category is for sub breeds resulting from any crosses French or foreign. The French prize list appears to be very liberal. and the "general regulations" to be very judicious. *T*heir next annual Exhibition is fixed to take place at *P*aris from the 22nd May to the 6th June next.

In looking over the several communications which have appeared in the Gazette upon the agriculture of Lower Canada, I find there are many things omitted which might be worthy the attention of agriculturists. In the cultivation of turnips, carrots, mangold wurtzel, &c., the ravages of vermin are found very destructive and it is said, and I believe it to be true from my own experience, that one of the great causes of injury to these crops in the early stages of their growth, is the common practice of manuring for the crop from the farm yard at the time of depositing the seed. The manure thus applied in the months of May and June cherishes the turnip fly and other insects, that make such devastation among the young plants of all these crops —and to prevent this, the manure should if possible be worked into the land previously, and well incorporated with the soil, before the drills are formed, and this will in a great measure prevent the ravages of insects. If any artificial manure containing invigorating qualities is applied, the time of sowing is the most advantageous. It is of great consequence to attend to these matters, as the loss of these crops, or of the first sowing of them, is a serious evil. Lime is a substance that is not much used in our agriculture, chiefly in consequence of its high price—and I cannot understand why the price should be so high as it usually is. Where lime is not found in the soil in sufficient

quantity, its application is as necessary in good husbandry as any other substance which we apply. The best way to apply it is—by a slight dressing to the land, immediately before the manure from the farm yard is applied, which being thus acted upon by the lime, forms ammonia, a great portion of which will be absorbed by the soil, and nourish the young plants, instead of being deissipated by the atmosphere. The good effects of all fertilizing application for the improvement of the soil, depend upon a variety of circumstances, and more particularly upon the nature of the soil and the time and mode of making the application, and the cause of frequent failure arises from ignorance of the true nature of the soil, and the injudicious application of fertilizing substances. Hence, when failure and disappointement result, the parties condemn what they term scientific or book farming, which recommended them to expend money upon the purchase and application of so called fertilizers, which they found to be of no value in practice. No doubt many frauds are committed by vendors of pretended fertilizers, that have no real value in Agriculture, and Agriculturists have been imposed on frequently; but that is the fault of the Agriculturist who would expend his money upon trash, without first ascertaining, upon reliable authority or sufficient security, that the substance offered for sale was what it was represented to be, and if it was not proved to be so on experiment, his money should be returned, with all the expenses and loss incurred. There are means of testing the fertilizing quality of all manures offered for sale, and if dealers in such commodities take upon them to advertise and sell these articles as containing certain valuable qualities without having themselves properly ascertained whether they are what they represent them to be, they should be liable to pay all the loss incurred by their purchase and use, It would be a very inadequate satisfaction to the farmer to be only paid back the amount actually paid for a worthless article, unless he was also entitled to be paid for the loss he sustained by imposition. If this rule was established and acted upon, we should have no frauds of this nature to complain of; and, in England, the vendor of worthless fertilizers are subject to an action, and obliged to pay all the damages. If we only use fertilizing substances of established character, and that have been already experimented with, and apply them in the proper manner and at the proper time, we shall not suffer loss or disappointment by their use, and unless we are resolved to do all that is necessary to insure their success, it would be much better never to purchase them, and no farmer should purchase them that did not understand what he should do with them and how to apply them.

The judicious mixture of different qualities of soils is one of the best means to improve them. A dressing of heavy clay to light soil will have a very beneficial effect, and of light soil to heavy clay will be equally beneficial. There is ample supplies in Canada of various sorts of marl, which I have no doubt would answer an excellent purpose applied to heavy clay soils. Marl should be regularly analysed to ascertain its exact quality. The white shell marl would be the best to apply to strong clay land. A heavy dressing would be required to be well incorporated with the soil, and I believe such soils, properly marled, would be rendered more suitable for every variety of crop, its texture greatly improved, and much more readily worked at all seasons. Light sandy soils, dressed with heavy clay is also vastly improved, but these sort of improvements are expensive if the different soils are at a considerable distance from each other. We have bog or moss soils, which are not of much value in this Country, unless dressed with either clay or sandy soil. Frequently the moss is not very deep, and strong soil may be found at no great distance from the surface, under the moss. When this is the case, the improvement is easy effected, by digging up the strong and mixing it with the moss on the surface. By this mixture and sufficient draining, moss soils would be converted into very useful land for any purpose except, perhaps, for producing wheat.

But were I to continue to offer the hints and suggestions on agricultural improvement which occur to me from time to time, I should never bring this review to a conclusion, and therefore I shall bring it to a close at once, and only hope it may be as useful as I wish it to be. I know that I must have fallen into the error of repetition, which was almost unavoidable, in consequence of the manner in which it has been published, at intervals commencing in November last. But with all its faults, it has gone before the public, who will appreciate any part that is worth their notice, and who I hope will forgive what was faulty and useless.

Before I conclude my observations on the Agriculture of Lower-Canada, I may advert to the Canals and Railroads which have already been completed, and are in progress of construction. As ample means of rapid and cheap communication, is of the first importance to the Agricultural, as to all other interests in Canda, it is very satisfactory to

know, that provision has been made for completing lines of railroad from one extremity o the Province to the other, with collateral branches, which, combined with our canals and water communication will be in some degree commensurate with the capabilities of this vast and noble country for production and population. It is a fact not to be questioned, that ample, easy and cheap means of transport, and communication, is the most certain encouragement that can be given to agricultural improvement, and to the general settlement of this fine country, as the want of such means must act as the greatest discouragement and bar to both improvement, and the settlement of the country. The value of our railroads, canals &c., should not be overlooked, or under estimated. They encourage production, by increasing their value in proportion as they diminish the cost of transport to market. I view these great works as being necessary for the developing of the vast resources of this great country—and which could not be done for centuries to come, without such aids. Their construction has been provided for by our Legislature in the first instance, because they considered them necessary, and that necessity exists now in as full force as it ever did. If the country is largely in debt, we shall have the canals and railroads, and cannot be deprived of them, and it now becomes our duty to make the best use of them, by endeavoring to find full employment for them by our increased productions, and by travel upon them, and thus be able to pay creditors who had perfect confidence in our means to give full employment to all our public works. A stranger viewing a map of Canada and seeing our navigable water and tracks of railroads marked out upon it, would very properly imagine that there was every facility for the settlement of the country. Compare the country with these advantages, and what it would be without them, and the difference will be found to exceed the expenditure upon these great works, if the calculation is made correctly. By constructing a canal or railroad through the wild forest, never before trodden by civilised man, it is at once opened for settlement, and rendered capable of yielding valuable productions. We do not give ourselves the trouble to examine into these matters in all their bearings, before we pronounce an unfavorable opinion upon them. If the canals and railroads now completed, in progress of construction or otherwise provided for, will not pay, it will be the fault of the people,—because they are placed in the most judicious position, possibly through a vast extent of fertile country, which does not now yield a fourth of what they are capable of producing. I have seen railroads made through countries that are far from fertile, and where the land is scarcely capable of yielding any valuable productions; but it is not so with us; on the contrary, our railroads are generally located through a fertile soil, capable of producing abundance of corn and cattle. The value of Canada for settlement, for agriculture and for trade and commerce, within the last 25 years, I have no doubt has nearly doubled by the improvement of her water communications and her railroads. I hope, therefore, we shall not hear any more complaints about the debt we have incurred for these works, but endeavour to complete them as soon as possible; and then increase our productions to the uttermost, so as to give them full employment.

The results of the present harvest would indicate the necessity of many improvements in the cultivation and management of our lands for the ensuing year. Now is the time to prepare and drain our arable lands, so that they shall be fit to sow and plant immediately upon the disappearance of the snow in spring. Applying manure in the fall to land intended for potatoes and other root crops in the spring, would be very advisable for any farmer who has it in his power to do so. Every possible means should be adopted to assist early planting and sowing in the spring. If satisfactory crops do not result from early sowing and planting, they are not likely to be produced from late sowing and planting, with perhaps the exception of wheat, which, if not sown, previous to the 20th or 25th of April, I would not take upon me to advise it to be done from that time to the end of May, while we are subject to the visitation of the wheat fly at the usual period of its appearance.

The high price always attainable for horses in Lower Canada, offers a great encouragement to increase the number of this stock by judicious breeding and selection. There is also abundant encouragement for increasing the number of our neat cattle, sheep and swine as there are good prices to be obtained, and a steady and increasing demand for these animals, either alive or in beef, mutton or pork.

Dairy produce, in cheese and butter, if of good quality, commands a very fair and remunerating price. The farm live stocks requires to be augmented; but to make them profitable, they must be kept properly and constantly in an improving condition. Unless they pay a fair price for what they consume, it would be better not to augment our live stock; and it is only when they are increasing in size and value, or producing milk, cheese, butter

and wool, in proper proportions, that they can pay a fair price. This is the secret of keeping farm live stock to profit. It is the same in regard to raising crops, to advantage—unless they produce what will fairly remunerate for labor, seed and land, it would be better not to cultivate them. Fortunately, however, both live stock and crops may be cultivated and raised to profit by the skilful and industrious agriculturist. We never before had such encouraging prospects for the agriculturist to employ every means to augment the products of his land; and I hope this encouragement will have the effect of introducing an improved system of husbandry throughout Lower Canada, when it is so evident that improvement is conducive to our prosperity and enjoyment. If all other arguments fail, self interest may operate powerfully; and I most sincerely hope it may in so far as the improvement of agriculture is concerned. It is very possible that self interest may be carried to extremes; but in this instance of endeavoring to increase the quantity and improve the quality of the productions of our land and labor, it will be a laudable motive for action, and not much danger of being carried to excess.

Owing to illness during a portion of the time this series of communications was being prepared in pamphlet form, and full occupation for the last few weeks, the author has been prevented from bestowing upon them that attention necessary to their correction and arrangement; but submitting them to agriculturists with some trifling imperfections, he trusts they will be found to contain such useful suggestions as will contribute in some degree to promote the improvement of agriculture, or the prosperity of agriculturists.